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Archaeological Research in Albania

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Archaeological Research and Researchers in Albania

by ZANA KAMBERI*

EARLY ARCHAEOLOGICAL RESEARCH BEFORE THE SECOND WORLD WAR

Introduction

There is a wealth of archaeological material from every part of Albania belonging to the Palaeolithic, Mesolithic, Neolithic, Eneolithic, Bronze and Iron Ages, Antiquity and the medieval period. This archaeological richness has attracted the attention of visitors and scholars, especially archaeologists, since medieval times. Most were foreign travellers who came to visit Albania and were so fascinated by its archaeological wealth that they returned to survey, research and sometimes excavate. The following overview, although very short and incomplete, is an attempt to record these endeavours.

Early archaeological investigations

An outline of archaeological research in Albania before the Communist regime tends to fall into two main parts. Before the 1920s, these endeavours did not tend to be systematic, did not usually involve excavation and were dominated by non-Albanians. After this time, a lack of resources and trained archaeologists in Albania meant that foreign projects, particularly those of the French and Italians, continued to dominate archaeology, but were now regulated by agreements with the Albanian government.

The history of archaeological research and researchers in Albania must begin with the commercial voyages of the Anconitan citizen, Ciriaco de Pizzicolli, to the eastern coasts of the Mediterranean. He was a scholar, although self-taught. His first voyage to the East (Constantinople and the Aegean islands) started in 1425 and after a short break continued until 1432. His second voyage began in October 1435 from Ancona to Illyria, Epirus and Greece and ended after a year in Egypt. He had visited these places during his first voyage in 1428 but it was only during the second one that he worked on what was to become the very basis of Albanian archaeology. While in Illyria, he visited Grammata (in the Acroceraunian range of the Vlorë district), Buthrotum (known today as Butrint, in the Saranda district, Dyrrachium (today known as Durrës) and Lissos (Lezhë today) (Kamsi, 1966: 405). The name Grammata is related to the inscriptions on the slopes of the rocks (Hammond, 1992: 31)

* National Archaeological Museum, Tiranë, Albania. Sponsored for a year's study at the Institute of Archaeology by a Cultural Exchange Fellowship.

where ancient mariners and passengers who stopped here in stormy weather carved their names on the rocks, as did priests who carved prayers in an effort to calm the sea. Ciriaco of Ancona copied some of these inscriptions belonging to the Dioscuri. He concentrated his attention, however, on Buthrotum where he had also stopped during his first voyage. During his second voyage he twice visited the remains and sculptural fragments here, and copied three inscriptions, one of which recorded the liberation of the slave G. Pomponius Lupercus. In May 1436 he went to Dyrrachium where he described the surrounding walls of the city and the eastern and the western gates of the castle. Near the western gate he copied an inscription of Sulpicius and another inscription describing some fortified banks, now to be found in the Narodni Muzej in Belgrade. He also visited the fortification of the 'Gate' four miles away, which he mistook for the trenches where the civil war between Caesar and Pompey had taken place. On 15 June 1436 Ciriaco of Ancona arrived in Lezhë, where he found walls made of huge stones and other skilful architectural monuments. He copied another inscription written on a huge block, that was later published (Hecquard, 1863: 23; Muratori, 1738: XXVIg). All his research was published in the six volumes of the *Comentarii* which unfortunately were lost during the fire of Alexander and Constano Sforza's library in Pesaro in 1451. Only some notebooks, autographs and notes that were collected carefully by his friends now remain.

Another humanist of the fifteenth century who made archaeological notes of interest was Marin Barleti. He was an Albanian and writer of a history of Skënderbeg (the national hero of Albania), in which he included notes on the remains at Dyrrachium, which could still be seen at the time as well as on other sites in Middle and North Albania (1964: 482).

One hundred and seventy years later, while carrying out a religious mission, Pjetër Bogdani, an Albanian priest, described and copied the inscriptions he found at the church of St George, near the river Buna (1875: 218).

Difficult political and historic circumstances, however, did little to encourage archaeological research in Albania so that the first records of ancient remains were made by foreign travellers and consuls. Among the first of those to describe the city of Apolloni and identify it with the Corinthian colony on the Illyrian coastline of the Adriatic was Napoleon's ex-consul in Ioannina, Pukëvili (H. Ceka, 1958: 213; N. Ceka 1982: 8). He visited Apolloni in 1806 and described the remains in detail, mentioning an ancient bas-relief and coins. He also visited Buthrotum and Byllis in the Fier district and also published his findings although it is clear that he mistook the positions of some of the ancient cities.

A few years later, William Martin Leake described a number of sculptural and epigraphic monuments that he had seen at the monastery of Pojan in Apolloni, briefly mentioned the surrounding wall and the existence outside the city walls of the remains of a temple (although not that at Shtyllas which was already known).

The French consul at the time, in Shkodër, Hecquard, visited many areas of Albania and described various artefacts. In Dyrrachium, for example, he recorded an opened grave with coins of King Monunius bearing the legend 'Basileus Monunius' dating to when the Illyrian Taulantii of this city had been under his rule. He also described a monumental grave with columns as well as various inscriptions (1836: 23).

The first archaeologist to come to Albania was the Frenchman Leon Heuzey, professor of History and Archaeology in the Academy of Fine Arts and a member of the Musée de Louvre in France. He was accompanied by H. Daumet, a member of the French Academy in Rome and Architect of State, and both were special envoys of Napoleon III, sent in order to study the development of the civil war between Caesar and Pompey and the military activities of Caesar in Illyria (1876: 393; H. Ceka, 1958: 214; N. Ceka, 1982: 9). Having sailed on the 'La Bische' ship, they landed in Palasë in the Vlorë district, in the same place as Caesar's armies had once landed. From here they went to Oricus and Dyrrachium and later to Apolloni and Shtyllas where Daumet carefully followed the plan of this large temple. They stayed longer in Dyrrachium where the famous conflict between Caesar and Pompey had taken place, and described many ancient sculptural fragments and inscriptions on the castle walls, such as an inscription that Ciriaco of Ancona had recorded earlier. Daumet made a drawing of the castle from what is now the coastline, that was faithful to the topography and architecture. Heuzey described the other monuments but did not excavate, concentrating instead on investigating sculptures and inscriptions, some of which were sent to the Musée de Louvre. He wrote two works and also planned the Dorian temple of Shtyllas, which nowadays remains only as a column.

The development towards systematic research in Apolloni (in the Fier district) was initiated by A. Gillieron, who visited this site a few years later but his plan of the surrounding walls of the city was, however, wrongly orientated (1877: 11; Heuzey, 1886: 30; H. Ceka, 1958: 214).

Foreign consuls were often well placed to carry out research in Northern Albania such as the Austrian consul Hahn (1876: 52), who surveyed the remains at Kala e Dalmacës in the Pukë district. Besides archaeology he also studied ethnography, folklore and linguistics. He was the first to define the position of Albanopolis (the ancient city which most probably gave the name to Albania today), in the village of Zgërdhesh in the Kruië district where he found substantial walled remains. The French consul Degrand excavated some graves in the castle at Dalmatia in 1899 and explored the districts of Mirditë, Dyrrachium and Apolloni (1901: 262). All the collected material was sent to the Saint Germain Museum in France. The Austro-Hungarian consul of Shkodër, Theodor Ippen (1901, 1907: 16) carried out a survey of many sites in Shkodër, such as Marshej, Koplik, Fushë-Shtoj, Dajç, Rash, Rrenc-Gajtan or Vuksan-Lekaj and mentioned a great number of archaeological objects of importance. He excavated in Koman, in Kala e Dalmacës, a site that attracted the attention of professional archaeologists as well, such as the prehistorian Traeger, who excavated there for two years (1899–1900). Franz Nopcsa also surveyed some graves at Koman in the Pukë district but found them robbed; only by the end of his excavations he did encounter an untouched grave.

In 1902 Karl Patsch, professor at the University of Vienna and a specialist in Balkan ethnology, history and archaeology came to Albania. He visited the district of Myzeqe (Berat, and Mallakastër and all the coastline from Seman to Vlorë) and this led to the publication of *Das Sandschak Berat in Albanien* that was dedicated to the study of the material culture of this area (1904). As a historian, he relied on the archaeological remains, mainly sculpture, architectural fragments and inscriptions that he had found at the monastery of St Marie in

Apolloni or in the surrounding villages and was not interested in the study of ancient topography or other remains which could still be found at the time of his visit. In November 1917 he visited Southern Albania accompanied by general Von Karl Korzulen (*Posta e Shqipnis* 1917: no. 3, 21) and also founded the first archaeological museum in Tiranë in 1922.

Archaeological research in Albania and especially in Apolloni increased during World War I. From 1916 to 1918, in co-operation with other institutes and the headquarters of the Austro-Hungarian army that had moved into Northern Albania down to the river Vjosë, the Academy of Sciences of Vienna organised a survey of the districts they now occupied. The expedition was headed by the archaeologist Camillo Praschniker who was now one of the military (Praschniker and Schober, 1919: 69). In Apolloni he excavated the surrounding wall, the acropolis, dwellings and graves. His first publication in 1916 was a general outline of the coast from the border with Montenegro down to Apolloni, a plan of the city wall as well as a description of some new sculptures and inscriptions. He also briefly stated the importance of his excavations here on a site that hitherto had been almost unknown archaeologically. He returned in November 1917 to continue his research until the autumn of 1918 when the Austro-Hungarian army had to retreat from Albania. He now distinguished, in a sketch, three lines of surrounding wall built in the same technique and a later fourth wall which narrowed the periphery of the city towards the south. He also discovered the foundations of a building dedicated to the goddess Artemis. He believed that Apolloni was a well-planned city. He surveyed outside the walls as well as the graves and considered those with sarcophagi covered by a thick mound of soil to be dated to the fourth century BC. Graves dated later than this were technically perfect and built with huge tiles. Broken amphorae were used to bury children. Praschniker also carefully studied the sculpture, most of which used the porous limestone from the areas around Apolloni and the hills of Mallakastër.

At the beginning of September 1917, the rector of the University of Vienna, Professor Haeger, came to Albania to undertake research at Mirditë. He followed a team of scholars from Vienna (Ignaz Dörther, a historian, Adolf Mahr, a zoologist, as well as Arnold Pentz and Hans Zerny who had arrived in the spring of 1916).

The first Albanian to excavate in this country was Shtjefën Konstantin Gjeçovi, born in Janjevë in Kosovë. He was the first to explain the meaning and importance of archaeology and outlined some rules necessary for systematic excavation. His work influenced other archaeologists and scholars such as Nopcsa, Ugolini or Marucchi. He excavated in three sites near Kuvend i Troshanit in Northern Albania and collected artefacts found by others and tried to gather information on where and in what circumstances they had been found. These were added to those objects he had found himself and with them he created the valuable archaeological collection in the Franciscan Museum at Shkodër (Kamsi, 1966: 411). A detailed description of his collection is given by Ugolini (1927: 18–59). In 1920 he excavated four tumuli near Kuvend i Troshanit, two in Kolëmarkajve, one in Kodërkuveth and one in Qarre. For each, he made a detailed inventory describing all the objects found, their positions and dimensions, and the position of the skeletons. He also attempted to undertake a comparative study of the burial rites of the ancient Illyrians and other peoples of the Balkans (Gjeçovi, 1920).

The archaeological surveys of Professor N. Hammond can also be included in the first phase of archaeological work in Albania. He explored the ancient sites of Epirus from 1929 to 1930 and completed his survey in 1939, giving a detailed presentation of this area as well as many other archaeological sites in South Albania in his book *Epirus*.

Early systematic archaeological research

The second part of this early stage, that of systematic investigation in Albania, began in 1923 when an archaeological agreement between Albania and France was signed which gave the French government the right to excavate in Shkodër, Dyrrachium, Berat and Apolloni. After surveying in Dyrrachium, the French project worked mainly on systematic excavations in the ancient city of Apolloni. It was headed by Leon Rey (H. Ceka, 1958: 219; N. Ceka, 1972: 10), an outstanding archaeologist and progressive, and was funded by the Academy of Inscriptions and Fine Arts and by French archaeological societies. The French had been given a concession of 30 years for the cities of Apolloni, Dyrrachium and other archaeological sites although here there were no investigations at all during the first 15 years because of various problems. At Apolloni, there were no surface remains to act as a starting point for excavation because they had been dismantled to build new houses. Secondly, a great part of the ancient city had come under cultivation and the project did not have the necessary funds for expropriations. The French were obliged, therefore, to carry out only very limited excavations and to dump the spoil nearby, possibly covering other remains. Thirdly, in Apolloni the strata had become mixed by the ploughing that had been carried out since the medieval period at least. The only advantages available were the surveys made by Praschniker from 1916 to 1918. The French project finally excavated two Roman dwellings in 1924 and during the four coming years an original *stoa* of the fourth century BC. It led Rey to the centre of the city, where from 1930 until 1938 a number of interesting monuments, such as the odeon and library were excavated (N. Ceka, 1982: 10). The project was accompanied by the first Albanian archaeologist H. Ceka. During 15 years of excavations a rich collection of finds was made, which according to the agreement, was handed over to Fier town-hall. Rey's research was published in six numbers of *Albania* in France from 1920 to 1930 but some of this material remained unpublished. The French project left in 1939.

In December 1927 another archaeological agreement was signed, but now between the Albanian and Italian governments (*Fletorja zyrtare*: 1928: 2). This agreement was valid for 30 years and stated that the Italians could undertake excavation and research in the prefectures of Elbasan, Dibër, Kosovë, Vlorë, Gjirokastër, Korçë and Tiranë. The Italian project was to carry out methodological research and would throw light 'on the origin of the ancient Illyrians and would study the monuments and the material culture of the classical period...' (Albanian State Archive). The Italians had the right to study and publish the excavated material only within the first five years. Their team was headed by Ugolini, who had come to Albania two years before the agreement was reached as a representative of the National Museum in Rome to excavate on the Albanian coastline. He published his findings in *Albania Antica* (1927). From 1926 to 1927 he excavated in Phoenice in order to throw light on the relations between the two coasts of the Adriatic Sea and found that it had been a prehistoric

settlement that was reduced to a small and unimportant centre during the Roman period, findings he published in *Albania Antica* (1942). In 1928 he excavated in Buthrotum and wrongly considered it to be a Greek colony despite the inscriptions he had published that indicated that it was instead the centre of the Epirot tribe of Prasaibii. The surrounding walls were also wrongly identified as being of different periods. Attempting to draw attention to the Roman monuments, he only briefly mentioned the important buildings of the fourth to third centuries BC which testified, however, to a great economic and cultural development before this time. As inscriptions and sculptures had been the main focus of attention, the pottery, which had not been collected carefully, was not even published. On the southern slope of the hill, Ugolini discovered the surrounding walls of the city, which were fortified with towers and gates which had served as entrances as well as strategic points in case of siege. The excavations in Buthrotum went on for 13 years. During this time Ugolini, who lived in isolation for many months amongst the forests and swamps, contracted malaria which brought about his death in 1936. His team therefore had to publish the results of his excavations in three volumes of *Albania Antica*, namely *Ricerca Archeologica*, *L'Acropoli di Fenice*, *L'Acropoli di Butrinto*, and a separate edition *Il Mito d'Enea, Gli scavi*, making use of his excavation diaries. Naturally they lack quality and accuracy.

Only two investigations were made at this time into the prehistory of Albania. In 1936, another Italian, Cardini, excavated the cave at Velçë in the Vlorë district where the painted pottery was dated to the Eneolithic judging by the stone tools published in Mustilli's preliminary report. The pottery is now seen as being Late Neolithic in date. He also published the stratigraphy of the Late Neolithic cave at Spile in the Vlorë district (Mustilli, 1941; Prendi, 1976: 21).

During the 1930s, the German archaeologist Bolko von Rithoffen, undertook surveys mainly in the Dajti mountains of the Tiranë district and published the data in the German journal *Quaternar* (1939).

After Ugolini's death, the excavations in Buthrotum were headed by Pirro Marconi, who died accidentally while flying back to Italy and the record of his excavations from 1937 to 1938 were burnt. From 1938 to 1940, the last years of the excavations in Buthrotum, the Italian team was headed by Professor Domenico Mustilli and concentrated mainly on the plain on the southern slope of Buthrotum up to the northern side of the Vivari Canal. Excavations were also carried out in some parts of the necropolis, outside the city walls on its western side, but these were very limited. During the perennial excavations here, many public and private dwellings and streets, as well as sculptures and local and imported artefacts were brought to light. Unfortunately, these excavations were accompanied by a systematic robbery of the best artistic pieces of the city. Mustilli also excavated Palaeolithic sites elsewhere in 1939 but only published a brief and little illustrated preliminary report (Prendi, 1976: 21).

The Fascist occupation in Albania in 1939 marked the end of the French project in Apolloni. From then on the Italians, headed by Claudio Sestieri, continued work here (H. Ceka, 1958: 11; N. Ceka, 1982: 229). In autumn 1941 excavations on the eastern wall of the city and in the southwestern part of the monastery were carried out. Sestieri dated the surrounding wall to the fifth century BC; the gymnasium to the sixth century BC with later constructions in

the second to fourth centuries BC. At Kryegjatë in the Fier district, a sepulchral monument was excavated, which was a temple *in antis* with four columns of Corinthian style on the facade, which he dated to AD 160. These excavations were followed by trenches and fortifications made by a German garrison and most of the monuments were completely destroyed (N. Ceka, 1982: 11).

Another agreement of a foreign country with the Albanian government before the Second World War consisted of the setting up of a Romanian Institute of Archaeological Research in Albania centred in Zogaj (Sarandë), and an eventual archaeological Albanian–Romanian convention was signed. According to a document of 1939 (Albanian State Archive: 194/31:22.2.1939), King Zog donated a plot of land to Professor Nicolla Jorga, a Romanian citizen, where the building of the Romanian Archaeological Institute commenced. Meanwhile Professor Berciu had come to Albania to direct the excavations. The Romanian government and Professor Jorga demanded the renouncement of some areas from the French, especially Shkodër and the necropolis of Koman in the Pukë district, in favour of the Romanians. The agreed zones given to the Romanian legation for excavations included the subprefecture of Mirditë and Lezhë as well as the city of Shkodër and its suburbs, the subprefectures of Shijak, Kavajë, Skrapar and Lushnjë and the prefecture of Tiranë.

According to an official document (2212/1 dt. 7/9/39 of the Council of Ministers), the Ministry of Foreign Affairs granted the Romanians temporary permission to undertake research in these districts although it was to be limited to surface investigations. They were not to excavate until an archaeological agreement similar to those with France and Italy was signed. This was interrupted, however, by the intervention of Ugolini to the Albanian government as he feared that the Romanians would undertake investigations in Sarandë, which was in his concession.

In summary, the foreign expeditions that excavated in Albania during the 1920s and 1930s concentrated on Graeco-Roman civilisation. Only in its last years under Cardini did the Italian project investigate prehistoric remains in Albania. These attempts, however, were very short-lived and did not succeed in clarifying the Palaeolithic or Bronze Age. The material discovered by Cardini remains unpublished, as when it was sent to Italy for study, it unfortunately disappeared completely (Prendi, 1976: 21; Anamali, 1969: 91). World War II marked the end of the foreign archaeological research in Albania. It had only been possible because the Albanian state had lacked the necessary funds and those in political circles had lacked an interest in archaeology. Nevertheless, it was during this period that the foundations of archaeology were laid in Albania.

ARCHAEOLOGY DURING THE COMMUNIST PERIOD

The next main stage of archaeological research began when the new Communist regime was established after the Second World War. All the earlier archaeological agreements between Albania and foreign countries were annulled and from now on no foreign archaeologists were allowed to carry out excavations, surveys or research in Albania.

In 1948 as part of the Institute of Sciences, the Archaeological-Ethnographic Museum was founded with the duty of research, protection and study of archaeological remains. The only two Albanian archaeologists of that time, H. Ceka and S. Anamali, started their work soon after the war of assessing the condition of archaeological and historical remains from all over the country, to take measures for their protection, to collect objects that had survived the war and pillaging as well as to discover new sites. In 1955 the archaeological section which worked in the Archaeological-Ethnographic Museum became part of the Institute of History and Linguistics, which was dependent on the Institute of Sciences. In 1957, when the State University of Tiranë was founded, this section in the Institute of History and Linguistics became part of the Faculty of History and Philology under the aegis of the State University of Tiranë. In 1976 the Centre of Archaeological Research was founded dependent on the Academy of Sciences, responsible for archaeological research and museums throughout the country. It was made up of three departments (Prehistory, Illyrian Antiquity and Early Medieval), with archaeological units in eight cities all over Albania (Durrës, i.e. Dyrrachium, Fier, Sarandë, Elbasan, Korçë, Shkodër, Peshkopi and Kukës) and five archaeological museums: the National Museum of Archaeology in Tiranë, founded in 1948, the Archaeological Museums of Butrint, i.e. Buthrotum, in 1950, Durrës in 1951, Apolloni in 1957, and Korçë in 1983. It also included the Numismatic Cabinet, the Anthropological Laboratory and the Epigraphic Cabinet. From 1990 onwards it has been known as the Institute of Archaeology. The recent changes that have taken place in Albania have brought about changes in the policy of the Institute towards co-operation with foreign archaeologists which has increased greatly. Joint excavations with foreign groups have begun and are increasing.

Due to the special circumstances in which it developed, i.e. in complete isolation from the rest of the world, Albanian archaeology of the Communist period concentrated on excavation and research into the origin of the Illyrians and Illyrian-Albanian continuity. More specifically, it examined in most detail Prehistoric culture, Illyrian Antiquity and early medieval Albanian culture.

Prehistoric Archaeology

Excavation and research into prehistory began relatively late, not only compared to the other countries in the Balkans, but also to other periods studied in Albania. Very little was done in this field before World War II by foreign projects: some surveys of two prehistoric settlements in the Sarandë district (Xarë and Shën Marinë) and an excavation in the cave at Velçë in the Vlorë district. Nothing was published except for one preliminary report. After the War excavations were carried out on tumuli and flat cemeteries as well as on settlements and cave dwellings, and research on this period increased greatly (Fig. 1).

a) Tumuli and flat cemeteries

The first excavations were undertaken on Iron and Bronze Age tumuli only after the Second World War. From 1952 until 1954 excavations were carried out on some tumuli in the middle valley of the river Mat in the Burrel district by S. Islami, H. Ceka, F. Prendi and S. Anamali.

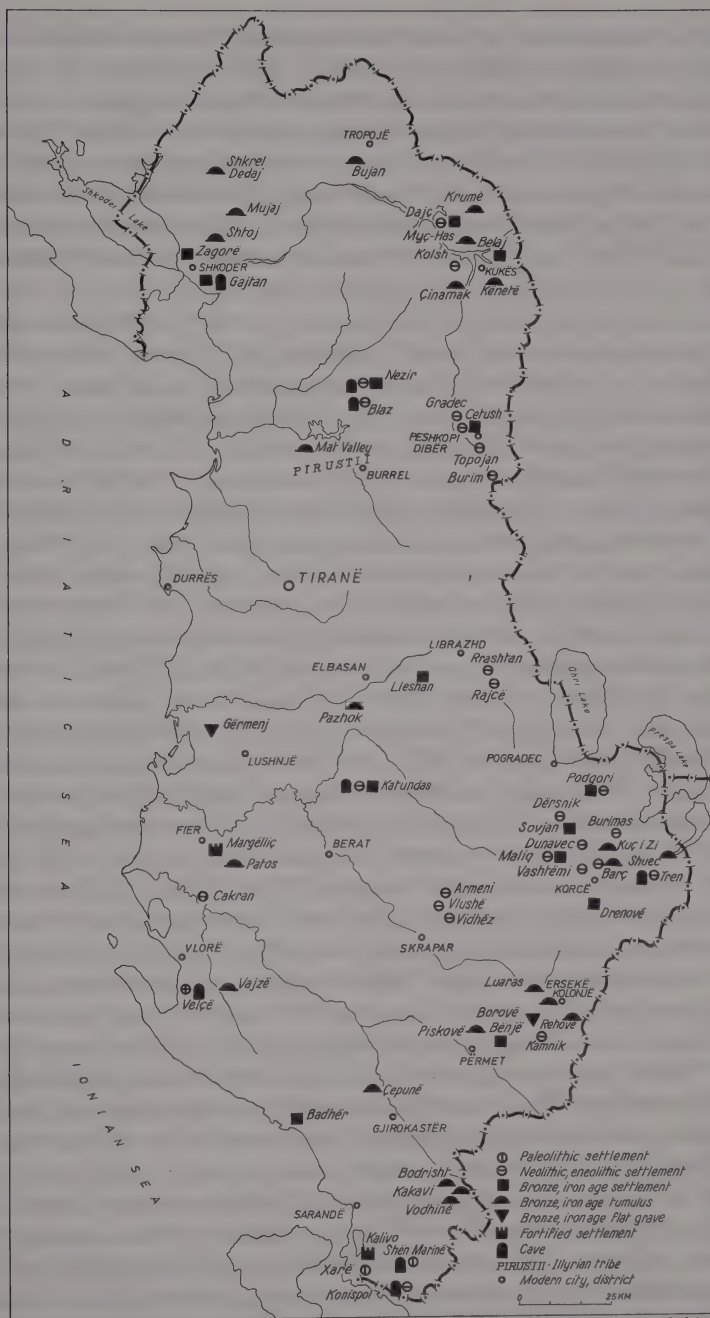


Fig. 1 Prehistoric tumuli, settlements and caves in Albania.

This area has the greatest density of tumuli in Albania dating from the Early Iron Age to the Roman Period and includes weapons, tools, pottery, textiles and leather. It was defined as being the material culture of the Illyrian tribe 'Pirustae'. Data were gathered on the architecture of the tumuli as well as the condition of the graves and the skeletons. Excavations of these tumuli continued in 1971 when the tumulus at Sukë e Lepurit in the Burrel district was excavated (Kurti, 1972) and in 1975, 1978 and 1980 (Andrea, 1983-4: 106) when 11 tumuli were opened by D. Kurti. From 1953 to 1954 the tumuli at Vajzë in the Vlorë district were excavated (Prendi, 1955); from 1955 to 1956 Kakavi and Bodrisht in the Gjirokastrë district (Prendi, 1959); in 1956 Vodhinë in the Gjirokastrë district (Prendi, 1956); in 1960 the well-known tumulus necropolis at Pazhok in the Elbasan district was dug by S. Islami and H. Ceka; in 1973 N. Bodinaku opened four tumuli consisting of 93 graves of the eighteenth to thirteenth centuries BC; in 1967 Krumë in the Kukës district was excavated (Jubani, 1968) which continued in 1989 (*Iliria* 1989/2: 269-70); in 1968 four tumuli in the village of Kënetë in the Kukës district were dug by B. Jubani (Andrea, 1983-4: 105) and in 1977 the other two remaining Tumuli nos 5 and 6 were excavated by A. Hoti, and of the 36 graves found, two belonged to the Late Bronze Age, while the remainder dated to the sixth and fifth centuries BC with pottery of various types, bronze and iron objects (ibid. 105); from 1969 to 1970 the Illyrian tumuli of Kuç i Zi in the Korçë district yielded very rich archaeological material dating to the first centuries of the last millennium BC (Andrea, 1969); from 1969 to 1970 the tumulus graves of Çinamak in the Kukës district were excavated (Jubani, 1969) dating from the Bronze Age to the early medieval period and from 1973 to 1975 four other tumuli were opened here by B. Jubani; in 1969 the tumuli at Çepunë in the Gjirokastrë district were investigated (Budina, 1969a); in 1971, and from 1973 to 1975 the Illyrian tumulus-cemetery of Barç in the Korçë district (Andrea, 1971a, 1983-4: 113) where two earth tumuli encircled by rings of stone were excavated, containing 205 graves of three kinds: a simple trench, a trench lined with stones and an urn placed in a trench; in 1973 a tumulus near the town of Ersekë in the Kolonja district was excavated by S. Aliu where 75 graves of the Late Bronze Age and Early Iron Age were discovered (Andrea, 1983-4: 115); in 1976 an earth tumulus was excavated by M. Korkuti at Patos in the Fier district which consisted of 78 graves of the eighteenth to thirteenth centuries BC (ibid. 109); from 1978 to 1979 N. Bodinaku opened three tumuli in the cemetery near the village of Piskovë in the Upper Vjosë valley (ibid. 115); in 1978 a flat cemetery in Gërmenj in the Lushnjë district was investigated by Z. Andrea (ibid. 109) where 37 graves dating from the Late Bronze Age to the medieval period were found; from 1979 to 1980 285 graves were opened by S. Aliu at Rehovë in the Kolonjë district, with a few belonging to the Late Iron Age, and the remainder to different phases of the Early Iron Age; in 1980, and from 1982 to 1984 excavations were carried out by A. Koka in the tumulus cemetery at Shtoj in the Shkodër district where dozens of tumuli were situated 25-100 m apart; in 1980, S. Aliu and J. Qiriako excavated a flat cemetery near the village of Borovë in the Kolonjë district where 49 graves were found, consisting of holes encircled by stones dating from the seventh to fifth centuries and fourth to second centuries BC with a bronze helmet of the seventh century BC, the earliest Illyrian type in Albania (ibid. 115); in 1983 the necropolis of Shkrel in the village of Dedaj in the Shkodër district was opened by B. Jubani;

in 1984 B. Jubani and in 1986 Z. Andrea excavated the tumuli of Bujan in the Tropojë district (*Iliria* 1984/2: 261–2, 1986/2: 254–5); in 1987 the tumuli at Mujaj in the Shkodër district (*Iliria* 1987/2: 243–4); in 1988 the tumulus necropolis of Myç-Has in the Kukës district by M. Belaj (*Iliria* 1988/2: 251–2); in the hilly region situated on the east of the village at Luaras in the Korçë district excavations were undertaken by S. Aliu from 1988 to 1989 (*Iliria* 1988/2: 250–1, 1989/2: 267–9) and 15 tumuli were discovered of which only one has been excavated. Near the village of Shuec in the Korçë district by the lake at Prespë e Vogël two tumuli were found, of which Tumulus I was excavated by Z. Andrea in 1990 (*Iliria* 1990/2: 256).

b) Settlements and cave dwellings

Soon after World War II, the Albanian archaeologists F. Prendi, Z. Andrea and M. Korkuti began a survey of the prehistoric settlement that was discovered during the drainage of the swamp at Maliq in the Korçë district in 1961 (Anamali, 1969: 93) that continued for six years. After an interruption, it was restarted from 1973 to 1974 by F. Prendi (Andrea, 1983–4: 114) and from 1988 to 1989 by Z. Andrea and P. Lera (*Iliria*, 1988/2: 248–9, 1989/2: 265–6). Ten phases of development were defined: Maliq I and II, the Late Neolithic (2700 bc), Maliq IIa and b, the Eneolithic (c. 2600), Maliq IIIa and b, the Early Bronze Age (2100 bc); Maliq IIIc1 and IIIc2, the Middle Bronze Age (1700 bc) and Maliq IIId1 and IIId2, the Late Bronze Age (1500 bc). From 1953 to 1954, F. Prendi surveyed the cave at Velçë in the Vlorë district (that had been investigated earlier by the Italian project). From 1961 to 1963 the castle of Gajtani in the Shkodër district was excavated by S. Islami and H. Ceka, and from 1965 to 1966 excavations were carried out at Tren in the Korçë district by M. Korkuti and Z. Andrea (Korkuti and Anamali, 1967). In 1967, 1968 and 1970 excavations were begun in the settlement of Cakran in the Fier district by M. Korkuti and Z. Andrea (1969, 1972; Anamali, 1969: 92, 94). This Eneolithic settlement is very interesting because of its architecture that is partially underground. To verify some of their conclusions, control excavations were carried out in three points by M. Korkuti in 1984 (*Iliria*, 1984/2: 258). In 1969 and 1970 excavations began on the settlement of Kamnik in the Kolonjë district by S. Aliu and F. Prendi (Aliu, 1969; Aliu and Jubani, 1969; Prendi, 1971; Prendi and Aliu, 1971) and in 1971 and 1973 were instigated on the Middle Neolithic settlement at Dunavec in the Korçë district by M. Korkuti (Andrea, 1983–4: 113); in 1974 M. Korkuti excavated near the village of Vashtëmi in the Korçë district (ibid. 113); from 1975 to 1976 the Neolithic settlement of Kolsh in the Kukës district was dug where two cultural layers belonging to the Early Neolithic and Middle Neolithic were distinguished by M. Korkuti (ibid. 105); from 1978 to 1980 F. Prendi excavated the multi-layer cave dwelling of Blaz in the Burrel district, with several strata ranging from the pre-Neolithic to the Eneolithic (ibid. 106); in 1978 the earliest Neolithic site in Albania, known so far, at Burimas in the Dibër district was investigated by Z. Andrea, (ibid. 107); from 1979 to 1980 M. Korkuti excavated the fortified settlement of Badhër in the Sarandë district; from 1979 to 1981 in the cave at Nezir in the Burrel district, Z. Andrea found four periods of inhabitation: the Middle Neolithic, the Eneolithic, the Early Bronze Age and Middle Bronze Age (ibid. 106); in 1980 M. Korkuti excavated the Eneolithic settlement at Gradec in the Dibër district and the prehistoric settlement of Cetush in the Dibër district

where two cultural layers were identified, the first belonging to the Early Neolithic and the second related to the Early Bronze Age pottery of Maliq IIIc (ibid. 107); in 1981 at the prehistoric settlement of Burimas in the Korçë district, M. Korkuti identified two phases of development (Burimas I and II) belonging to the Late Neolithic (Maliq I-Kamnik culture) and Eneolithic (Maliq II) (ibid. 113); P. Lera identified two cultural strata from 1981 to 1983 at the Neolithic settlement at Barç in the Korçë district: Barç I and II (ibid. 113); in 1982, F. Prendi, M. Korkuti and Z. Andrea excavated the prehistoric settlement at Podgori in the Korçë district that had been inhabited from the Early Neolithic to the Bronze Age and flourished during the Early Neolithic represented by three sub-phases of development (Podgori Ia, b and c) (ibid. 112–13); in 1983 M. Korkuti excavated the cave at Bënjë in the Përmet district that had been inhabited continuously from the Eneolithic to the Iron Age (ibid. 115); in 1984 the Early Neolithic settlement at Rrashtan in the Librazhd district was excavated by I. Gjipali (*Iliria* 1984/2: 257–8). In the same year, P. Lera excavated the Late Neolithic dwelling at Dërsnik in the Korçë district (*Iliria* 1984/2: 259; Lera, 1988) where two strata of inhabitation were defined. In 1986, M. Korkuti excavated the dwelling at Katundas in the Berat district (*Iliria* 1986/2: 251) where six periods of inhabitation were discovered dating to the Neolithic, Eneolithic, Bronze Age, Iron Age, the Illyrian Urban and Late Antiquity, each represented by its own pottery. In 1986 and 1987 M. Bela excavated the cave at Dajç (1987) in the Kukës district where three cultural layers of the Dajç I (the Copper Age), Dajç II (the Early Bronze Age) and Dajç III (the Late Bronze to Early Iron Age) were discovered. From 1987 to 1990 excavations were undertaken at Rajcë, Topojan, Belaj, Zagorë, Drenovë and Lleshan. The prehistoric settlement at Rajcë in the Librazhd district was excavated by I. Gjipali from 1987 to 1989. The Middle Neolithic settlement at Topojan in the Dibër district was excavated from 1987 to 1989 by A. Bunguri (*Iliria* 1987/2: 237–8, 1988/2: 246–7, 1989/2: 262–4). The site at Belaj in the Kukës district was excavated in 1987 by F. Prendi (*Iliria* 1987/2: 241–2) and two cultural layers were distinguished belonging to the Late Bronze Age and Antiquity. The Late Bronze Age settlement at Zagorë in the Shkodër district was excavated by Z. Andrea (*Iliria* 1987/2: 240–1) and its culture was defined as being similar to that of Belaj and Gajtan II. In the same year P. Lera excavated the Iron Age settlement at Drenovë in the Korçë district (ibid. 240–1). The settlement at Lleshan in the Elbasan district was excavated by R. Hasa from 1987 to 1990. Three cultural layers were found belonging to the Late Bronze Age, Iron Age and Illyrian Urban Period. The settlement of Lleshan had a surrounding system of three lines of walls of unhewn blocks of stone without mortar and was typical of Middle Albania. The excavations were concentrated in the acropolis, near the surrounding wall where a tract 9.5 m long was discovered. From 1989 to 1990 excavations were carried out in the prehistoric cave at Konispol in the Sarandë district by M. Korkuti and H. Shabani (*Iliria* 1989/2: 260–2, 1990/2: 249–50). The findings ranged in date from the Middle Neolithic to the medieval period. In 1990 the settlement at Vlushë in the Skrapar district was also excavated by L. Ylli (*Iliria* 1990/2: 249) in Armeni and Vidhëz. Together with pottery fragments, microlithic flintstone tools suggested that this was a Mesolithic site although Vlushë is now considered to belong to the transitional phase from the Mesolithic to the Neolithic. In the same year P. Lera excavated the prehistoric settle-

ment of Sovjan in the Korçë district (*Iliria* 1990/2: 250–2) where four horizons of habitation were found belonging to the Late Bronze Age (Maliq III_d) and the Iron Age (Maliq IV). Of special importance was the discovery of a cultural layer belonging to the Iron Age (known as Maliq IV_{a–c}).

This general overview of archaeological excavations that have been carried out on prehistoric sites since the Second World War has shown that their number has been great and the archaeological material rich. They have thrown light on the socio-economic development of Illyrian society, especially during the Iron Age, and have helped to clarify what is seen as the main problem in Albanian archaeology—the origin of the Illyrians. Archaeological research on settlements, caves and tumuli has given a general outline of the development of prehistoric cultures in Albania from the Palaeolithic to the Iron Age. The relations of these cultures to the neighbouring ones, e.g. the Palaeolithic and Mesolithic, are less known. Neolithic and Eneolithic cultures are studied in their three phases of development: Early, Middle and Late, based on archaeological material found in the settlements and cave dwellings. Bronze Age culture has also been studied in three phases, mainly via the tumuli that appeared for the first time during the Early Bronze Age. This, and the appearance at this stage of a rough barbotine pottery, led to a migration theory of a new population from the east, which lived side by side with the existing Eneolithic populations. The mixture of the two probably created an Illyrian identity by the end of the Bronze Age or beginning of the Iron Age, which can be traced through the material found in tumuli and fortified dwellings that now appeared amidst the economic and cultural disarray. Fortified settlements began to be built in the Bronze Age, such as Badhër in the Sarandë district. The fortified settlements of the Iron Age were placed at strategic points near natural passages in the valleys and hills which dominate the fertile plains. Three phases of their evolution can be traced: the Badhër phase (represented by Badhër and Margëlliç of the Late Bronze Age), the Gajtan phase (Iron Age II) and the Kalivo phase (proto-urban).

The Archaeology of Antiquity

Research in this period has concentrated on the Illyrian cities to study their level of socio-economic and cultural development at this stage. Excavations have been carried out in two main types of site: fortified settlements (the Illyrian and Epirot cities), and the ancient Greek and Roman colonies (Fig. 2).

a) Fortified settlements and Illyrian and Epirot cities

Excavation and research into fortified settlements and Illyrian cities began soon after World War II, in 1949, when the first two Albanian archaeologists, H. Ceka and S. Anamali launched an exploratory survey in the valley of Vjosë which made it possible to define a number of fortified and open settlements in Frakull, Cakran, Hekal, Klos (Fier district), Shkozë, Kalivaç, Matohasanaj (Vlorë district) and Tepelenë (Anamali, 1949). The survey launched by H. Ceka in the districts of Tepelenë and Gjirokastër (1952) yielded much data on the settlements and the surrounding walls of Shtëpezë (Gjirokastër district), Lekë (Tepelenë district) and Limar of the Përmet district. The ancient cities of Antigone and Fanotë in the

Gjirokastër district were identified and data on the castle at Zharrëz and the water pipe at Bënçë in the Tepelenë district were gathered.

From 1952 to 1971 a great number of Illyrian and Epirot centres were excavated. In 1956 F. Pundi surveyed the fortified settlement at Selo in Upper Devoll, in the Gjirokastër district. Amantia was excavated by H. Ceka and S. Anamali in 1958 (Anamali, 1964). Excavations concentrated mainly in the stadium (of the third and second centuries BC) which was part of the survey carried out in the district of Vlorë from 1953 to 1954 by Prendi (1955). The castle of Irmaj (Gramsh district) was excavated by Prendi and Budina in 1960, and Ripës in the Sarandë district in 1962 by Budina (1971). From 1963 to 1964 B. Dautaj and A. Mano excavated Dimal (Berat district) and identified it with the ruins of the fortress at Krotinë. The excavations yielded a rich archaeological material mainly of stamped pottery, statuettes and coins that led to re-excavation over several years from 1965 to 1966, 1971, and 1973 to 1974 (Korkuti and Anamali, 1967; Dautaj, 1971; Andrea, 1983–4: 111) especially the acropolis where a proto-urban stratum was excavated belonging to the sixth and fifth centuries BC and another belonging to the end of the fourth to second centuries BC when the settlement developed into a city. Structures of this period include various buildings, a retaining wall and a street. From 1965 to 1966 excavations were undertaken in another important city at Chaoni, in Antigone (Gjirokastër district) by D. Budina (Korkuti and Anamali, 1967) which continued from 1966 to 1967 (Budina, 1968). At the same time M. Korkuti and Z. Andrea excavated the Illyrian castle at Rosujë in the Tropojë district. The city of Antigone was identified by the inscriptions on some bronze voting-disks found during excavations in the fortress of Jermë. Excavations in Antigone continued from 1966 to 1970 (Budina, 1969, 1972) and from 1973 to 1974 (Andrea, 1983–4: 118). In 1970 excavations extended to some other ancient cities such as Selcë e Poshtme in the Pogradec district, Lissos (Lezhë) and Zharrëz (Andrea, 1971). Excavations in Selcë e Poshtme were continued in 1971 by N. Ceka (1972) who described and dated the four monumental graves found there and excavated the necropolis. The archaeological material found belonged to the fourth century BC until the fourth to sixth centuries AD when the settlement became a fortified military rural centre. The excavations in the ancient city of Lissos (Lezhë) were continued for years, in 1973, 1977, and from 1980 to 1983 by F. Prendi (Andrea, 1983–4: 105) on the surrounding wall where a highway and three gates were discovered. The largest gate is dated to the late fourth or early third century BC. In 1973 excavations were also undertaken in Zgërdhesh (Krujë district) by S. Islami as a continuation of those carried out in 1969 (*ibid.* 107). A pre-urban settlement and an Illyrian stratum (third to second centuries BC) were discovered. From 1973 to 1974 excavations were also carried out at Belsh in the Elbasan district (*ibid.* 108) in continuance of those of 1969. Several cultural strata were identified belonging to the Late Bronze Age, Early Iron Age, proto-urban phase (seventh to fifth centuries BC), Antiquity (fourth to first centuries BC) and Late Antiquity (fourth to sixth centuries AD). On the western side of the township a rich grave belonging to a member of the Illyrian military class was discovered, which contained 70 objects, mainly weapons, bronze and pottery vessels and silver ornaments. From 1973 to 1975, and in 1978, H. Spahiu excavated the Illyrian/Albanian city of Antipatrea/Berat which clarified the stratigraphy and the defence system where several phases of construction could be seen. It

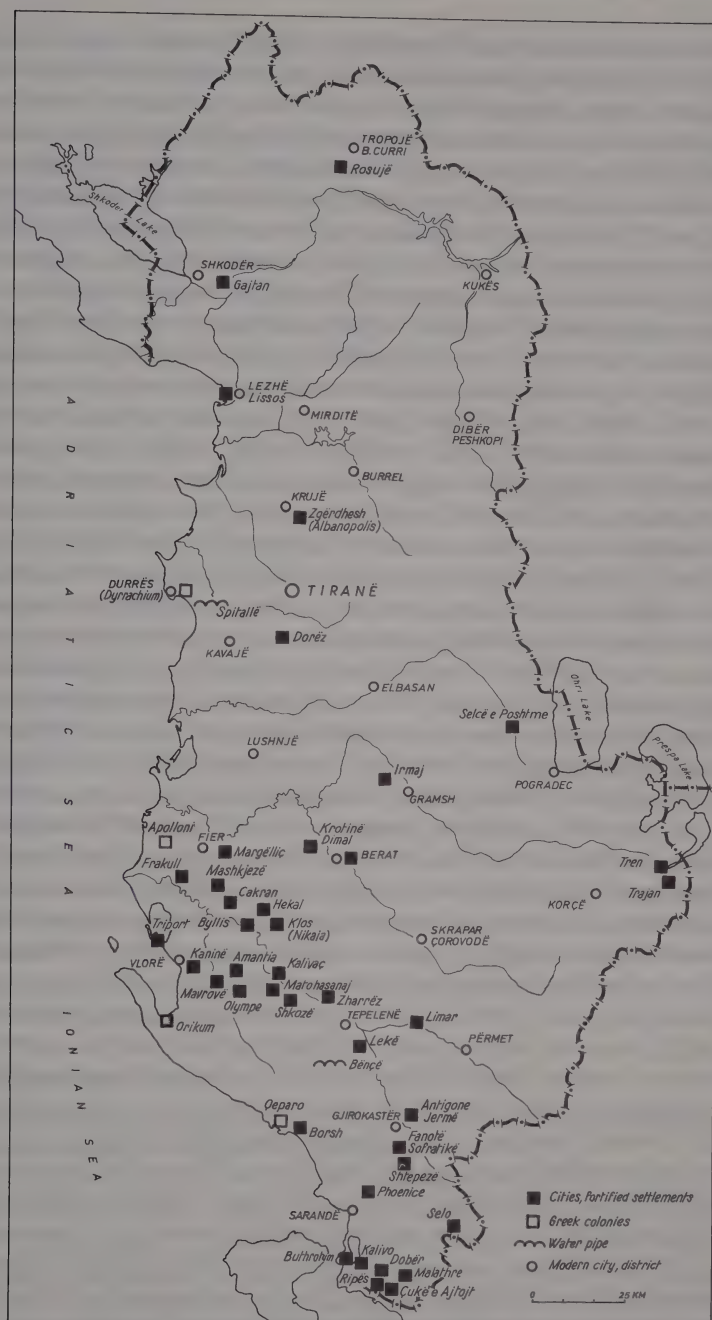


Fig. 2 The main sites and cities of the Greek and Roman period in Albania.

had been inhabited from the sixth to fifth centuries BC to the fourteenth century AD (ibid. 111). In 1973 and 1975 excavations were carried out by P. Lera and G. Karaiskaj on the hill at Gradisht, near the village of Symizë (Korçë district) where the ruins of a fortified Illyrian settlement lay (ibid. 114), which showed continuity from the Early Iron Age to the medieval period. In 1973, 1980 to 1981, and from 1989 to 1990 excavations were carried out in Phoenixe, the capital of Epirus and Chaoni in the Sarandë district, by D. Budina (ibid. 118) and from 1973 to 1975 in Klos (Fier district) by L. Papajani (ibid. 109). In 1973, 1975, and 1977 excavations were undertaken in Kaninë (Vlorë district) (ibid. 116) and several strata ranging from the proto-urban phase (seventh to fifth centuries BC) up to the fourteenth century were discovered by D. Komata. From 1974 to 1975 excavations were carried out in Qeparo (Vlorë district) by J. Koçi (ibid. 116) and from 1975 to 1976 in Triport (Vlorë district) (ibid. 116) by V. Bereti where three strata ranging from the fifth century BC to late antiquity were discovered. In 1976, 1980, 1986, 1988 and 1990 J. Koçi excavated the ruins of an ancient city in Borsh (Sarandë district) (ibid. 118; *Iliria* 1986/2: 261–2, 1989/2: 273–4, 1990/2: 266). During 1986, and from 1989 to 1990 excavations concentrated on a residence, the stratigraphy and a villa outside the city. From 1978 to 1981 and from 1984 to 1992 excavations were carried out in the Illyrian city of Byllis in the Fier district by N. Ceka (Andrea, 1983–4: 109; *Iliria* 1984/2: 262–3, 1986/2: 263–5, 1987/2: 246–8, 1989/2: 274–6, 1990/2: 261–2). From 1978 to 1981 a theatre, a stadium, a residence with a peristyle courtyard and the surrounding walls were found. From 1984 to 1990 excavations were concentrated in the *agora* in order to discover the *stoa*. From 1978 to 1979 excavations were carried out by S. Islami on the hill of Çukë e Ajtojt (Sarandë district) (Andrea, 1983–4: 116) where the ruins of an ancient city were identified, and work concentrated on the fortification system and houses. In 1979 excavations were undertaken in Mavrovë in the Vlorë district by B. Dautaj (ibid. 116) during which the surrounding walls of this fortified Illyrian settlement were traced and two periods of its building were defined (within the fourth century BC). In 1980 and 1983 Malathre (Sarandë) was excavated by D. Condi (ibid. 118). A fortification of rectangular form was excavated, with corner towers and, at the main entrance, false arches, that had been built in the third century BC to control the road between Buthrotum and Çukë e Ajtojt in the Sarandë district. In 1982 excavations were undertaken by N. Ceka on the Illyrian settlement of Margëlliç (Fier) and in 1983 in the fortified township of Mashkjezë (Fier) (ibid. 110). In 1984 and 1986 excavations were undertaken in Dobër in the Sarandë district by D. Condi (*Iliria* 1984/2: 266–7, 1986/2: 262–3) on a villa situated on a hill, which had been built during the third and second centuries BC, reconstructed in the first century BC and altered from the eighth to ninth centuries AD, despite undergoing a decline. In 1990 excavations were also carried out on the ancient city of Olympe (Vlorë district) by B. Dautaj (*Iliria* 1990/2: 266–7).

On the basis of the archaeological material gained through these excavations and research, archaeologists have been able to define a proto-urban phase (seventh to fifth centuries BC) before the development of Illyrian cities and civilisation. A prelude to this were the fortified settlements of the type at Trajan and Tren in the Korçë district and Gajtan in the Shkodër district where specialised crafts were carried out, such as pottery-making or metal-working. Another forerunner to the development of Illyrian cities was the wide relations established

with Corcyra, Corinth, Ionia, Attica and Laconia, for example, demonstrated by the presence of imported pottery in these proto-urban settlements. Buthrotum and Kalivo in the Sarandë district have been defined as proto-urban centres and Margëlliç (Fier), Mashkëzë (Fier), Triport (Vlorë), Dorëz (Tiranë) and Zgërdhesh (Krujë), for example, as fortified proto-urban settlements. Proto-urban layers have also been found in the foundations of the later cities such as Kaninë (Vlorë), Olympe (Vlorë), Klos (Fier), Berat, Belsh (Elbasan) and Selcë e Poshtme (Pogradec). Fully developed Illyrian cities developed from the fifth to third centuries BC, especially during the third century BC. During the first two centuries (fifth and fourth centuries BC) special attention was paid to fortification and four building phases can be distinguished. In the third century the layout, in particular the orthogonal system, became more important, as did large communal buildings (the *agora*) which created the architectural physiognomy of the cities. The main characteristics were: positioning the inhabited area on inclined ground, encircling it with walls; dividing the area within the walls into three main parts consisting of an acropolis (placed in the highest part), residential area and *agora*. During this period (fifth to first centuries BC), the cities played a special role in the formation of an Illyrian urban culture that had a generally Mediterranean feel. The excavated material consists of better quality tools and pottery, etc., that relied on Iron Age traditions but borrowed new forms from the Hellenistic world. The sophistication of this culture is testified to by the plentiful remains of crafts (such as pottery-making, metal-working, leather-working, etc.). During that period the development of an educational system similar to that of ancient Greece is suggested by finds such as *dyparchs* (wooden tables covered with wax) and *styli* (writing implements). *Strigils* and *lekythae* to clean the body after physical training in the *palestra* have been found. Inscriptions from Nikaia in the Fier district and Antigone in the Gjirokastër district testify to the existence of gymnasia, and other inscriptions from Byllis in the Fier district reveal that there was a fourth stage of education, the *peripola* (military training). The ideology and art of Illyrian urban culture is less well known, but the great quantity of sculpture, pottery and coins appear to reflect an Illyrian pantheon and mythology borrowed from the Greeks but complemented by local gods, goddesses and myths. At this time, tumuli were replaced by necropoleis of flat, largely inhumation, graves although during the second and first centuries BC, this changed in favour of cremation. Illyrian art forms consisted mainly of decorative relief and three-dimensional sculpture while decoration on the handles and bodies of pottery can also be found.

b) The Greek and Roman colonies

Excavations continued the work of the French and Italian projects from before World War II and concentrated mainly in Apolloni, Dyrrachium and Oricus.

In Apolloni investigations were carried out at various points: by H. Ceka and S. Anamali from 1956 to 1962 near the surrounding wall (H. Ceka, 1963), by H. Ceka on some quarters of the city; by S. Islami and H. Ceka on the terraces towards the west; by F. Prendi, D. Budina and B. Dautaj on the remains of a rich residence of the second and third centuries AD; by H. Ceka on the *nymphaeum*; by A. Mano on the necropolis in 1956 and in the theatre of the third century BC in 1971 (1959, 1971); by N. Ceka, V. Bereti and V. Dimo in 1973, 1976, and

from 1978 to 1979, and 1981 on the surrounding wall (Andrea, 1983–4: 110), by V. Dimo in 1980 and 1983 on the necropolis, and by L. Koçi and Dimo from 1986 to 1990 on the surrounding eastern wall, the southern gate where the tower was completely excavated, the eastern part of the city in Sector C, where traces of the surrounding wall 154 m long were found and Tumulus 3.

Excavations were also undertaken at Dyrrachium (Durrës) following the surveys made there before World War II. This city has been inhabited for almost 2,500 years and was once the greatest port on the eastern coast of the Adriatic. The modern city is, however, built over the remains, making large-scale excavation impossible, although the archaeology is now protected from damage by construction. Initial excavations began in 1957 on the Hellenistic necropolis (Anamali, 1957) and continued later on the Roman necropolis (Anamali and Budina, 1960). Later the baths (*thermae*) were excavated by V. Toçi and D. Budina. Excavations were carried out in the amphitheatre by V. Toçi in 1962 (1962). Excavations in the necropolis were continued by H. Hidri in 1973, 1977 and from 1980 to 1981 (Andrea, 1983–4: 108). From 1984 to 1990 excavations in Dyrrachium were carried out by H. Hidri, F. Tartari, L. Miraj, M. Zeqo and H. Myrto (*Iliria*, 1984/2: 267–8, 1986/2: 257, 1987/2: 248–51, 1988/2: 264–5, 1989/2: 286–8, 1990/2: 258–61). From 1984 until 1986 excavations concentrated on remains in the swamp whose architecture and location suggested it was a sanctuary. From 1986 to 1990 rescue excavations were carried out at various points. From 1988 to 1990 work concentrated on the amphitheatre and especially the galleries. The baths (*thermae*) were also dug in order to complete the architectural plan of those discovered in 1960. A hydro-sanitary system, lead pipe, cesspool, part of the outer canal, a house with a typical black and white mosaic depicting a naval mythology scene and the aqueduct at Spitallë in the Durrës district, two km north, were discovered.

In Oricus excavations were concentrated mainly on the theatre of the first centuries AD by D. Budina in 1958 (1964).

The rich archaeological data gathered during these more recent excavations and those carried out by foreign projects before World War II have made it possible to define the socio-economic circumstances of the formation of these colonies, their urban planning and architecture, craftsmanship, art, cults and burial rites. The Hellenistic colonisation of Illyria was realised in two phases. There was a long process of trading between the colonists and the natives, when groups of ancient Greeks settled in the most suitable places to carry out this trade. This process is testified to by written documents and archaeological findings. Appianus wrote that Epidamnus (Dyrrachium) was founded by Illyrian kings and later became a colony of the Corinthians and this is corroborated by a proto-urban layer of the seventh century BC consisting of Devollian ware, Corinthian and Ionic imported pottery. Plutarch and Stephanus Byzantius described Apolloni as an Illyrian settlement of the Taulantii, which then became a Hellenistic colony. The archaeological findings suggest that the settlement existed from the last decades of the seventh century BC while documents define 588 BC as the date of the founding of the colony.

During the first half of the sixth century BC Dyrrachium and Apolloni became proper cities of 100 hectares each. In Apolloni the surrounding wall with quadrangle blocks, an entrance

and acropolis were found. In the fifth and fourth centuries BC the surrounding wall was rebuilt and reinforced by a large bastion in the east and a new brick wall in the west. The necropolis lay outside the wall. Within the walls, the north-western part was used by the rural population. In the middle of the city were the *agora* (the theatre, *stoas*, official buildings, etc), *temenos*, temple and the altars. The inhabited area was in the western part of the hills and was divided by *insulae*. The orthogonal layout of Apolloni was accompanied by terraces because of the sloping ground, as at Oricus.

One of the main crafts at this time was pottery-making, either of building materials (tiles and bricks), or vessels (such as *pithoi*, amphorae, kitchen vessels, aesthetic objects, etc.) carried out both in state workshops (testified by stamps with the name of the *prytan*) and private workshops (where stamps with the name of the craftsman in the genitive have been found). Metalworking was also carried out, producing mainly iron tools and weapons.

The earliest art consists of imported objects such as terracotta and flat figurines made of lead and ivory which were imported from Corinth in the seventh and sixth centuries BC and were placed in burials. By the middle of the sixth century BC there was a monumental art in Dyrrachium. In Apolloni a relief with the theme of Amazons has been found in a Dorian temple (530 BC). Sculpture (such as the head of Artemis or Eros) and reliefs decorating monuments and stelae, and pottery date to the fourth and third centuries BC.

The most dominant god was Zeus, known locally as Jupiter Parthinus. In Apolloni, however, the main cult centred around Apollo, and Artemis, the guardian of cattle breeding. In Dyrrachium there was a cult of Nymphs in honour of natural fire.

The earliest burials in Apolloni consisted of tumuli. The main burial rite was that of cremation: ashes were often put in a vessel placed in the ground, although an alternative rite was that of placing the body in a hole in the tumuli. In the sixth century *pithoi* (storage vessels) were used to bury adults and amphorae for children but both had poor grave goods. In the fifth century BC sarcophagi were used but this changed in the fourth century BC to graves with tiles in the form of a roof and the number of grave goods increased. In Apolloni tumuli were used; in Dyrrachium, flat graves.

Roman archaeology

The excavations in many ancient cities have given a general view of the development of culture in South Illyria during the first to third centuries AD. By the end of the first century BC the colonies of Buthrotum, Byllis, Dyrrachium and Shkodër were created while Apolloni, Oricus, Amantia and Phoenice were *civitates liberae*. Gurzezë, Margëlliç, Zgërdhesh and Antigone were ruined during the Roman–Illyrian wars while Berat, Kaninë in the Vlorë district and Klos in the Fier district, etc., were abandoned. The number of low-status sites increased while landlords lived in *villae rusticae*. Stations were built along the Via Egnatia in the second and first centuries BC. There is a characteristic lack of defences, and during this time urban planning changed as cities moved to flatter areas which made possible a wider use of the orthogonal system.

The architecture of this period is most clearly seen in Apolloni and Dyrrachium where important changes were made to forms and building techniques. New communal buildings

like the amphitheatre and baths (*thermae*) were introduced and special attention was paid to inner areas. The new building technique used broken stones and masonry reinforced by bands of bricks, and *hypocausts* (central heating) were introduced. The main architectural features were now the theatre (Sofratikë in the Gjirokastër district), the amphitheatre (Dyrrachium), the odeon (Apolloni), the council chamber (Apolloni), the library, the baths (*thermae*), the aqueduct (Dyrrachium) and roads (Via Egnatia).

Craftsmanship was characterised by traditional forms of pottery, tools and decorative motifs but there were also new Roman types. An Illyrian provincial culture with its own identity came into being within the framework of the Roman Empire. Pottery was now commonly terra sigillata and, during the second and third centuries AD imitation terra sigillata, with building materials consisting of tiles and bricks and metalworking producing tools and ornaments.

Examples of the main art form, sculpture in the round, have been found at Apolloni, Dyrrachium, Buthrotum, Byllis, Amantia and Phoenice, with classically influenced sculpture as well as vernacular reliefs, such as the historical relief (frieze) in Dyrrachium. Portrait becomes important (such as that of Demosthenes of Apolloni, the Magistrate). In rural areas the main art form consisted of sepulchral reliefs with Illyrian figures in folk costume. Mosaics of the first century were typically black and, in the second and third centuries, white geometric figures and polychrome mythological figures. The foundation of the colonies was accompanied by the use of the Latin language. Latin inscriptions have been found dating to the first century BC, but are rare compared to Greek ones. They consisted of decrees and building inscriptions (dedicated to those who paid for construction work) such as at the aqueduct at Dyrrachium, the library, or the wall at Byllis).

Dedications were mainly to the emperors and gods. Milestones often bore the name of the emperor who had undertaken road-building, and have been found, for example, along the road between Dyrrachium and Apolloni. Sepulchral inscriptions on stelae containing dedication formulae (DMS), often bore the name of the dead in the genitive along with the name of the dedicator.

Early Medieval archaeology

One of the main topics examined by archaeologists in the study of Late Antiquity and early medieval culture after World War II was the problem of the genesis of the Albanian people (Fig. 3). Excavations and research in this area began with the discovery in the nineteenth century of a large cemetery in the village of Koman in the Pukë district which aroused lengthy debate. Opinions often differed, so in order to clarify them a number of excavations were undertaken both on early Arberian cemeteries as well as cities and castles.

a) Cemeteries

A number of early medieval cemeteries of the same date as that at Koman were excavated, such as Krujë where 28 graves were opened by S. Anamali and H. Spahiu in 1960 (1963). In 1961 excavations continued on the cemetery at Koman where 36 other graves were opened by S. Anamali and H. Spahiu (Spahiu, 1964), and they were continued from 1982 to 1983 by

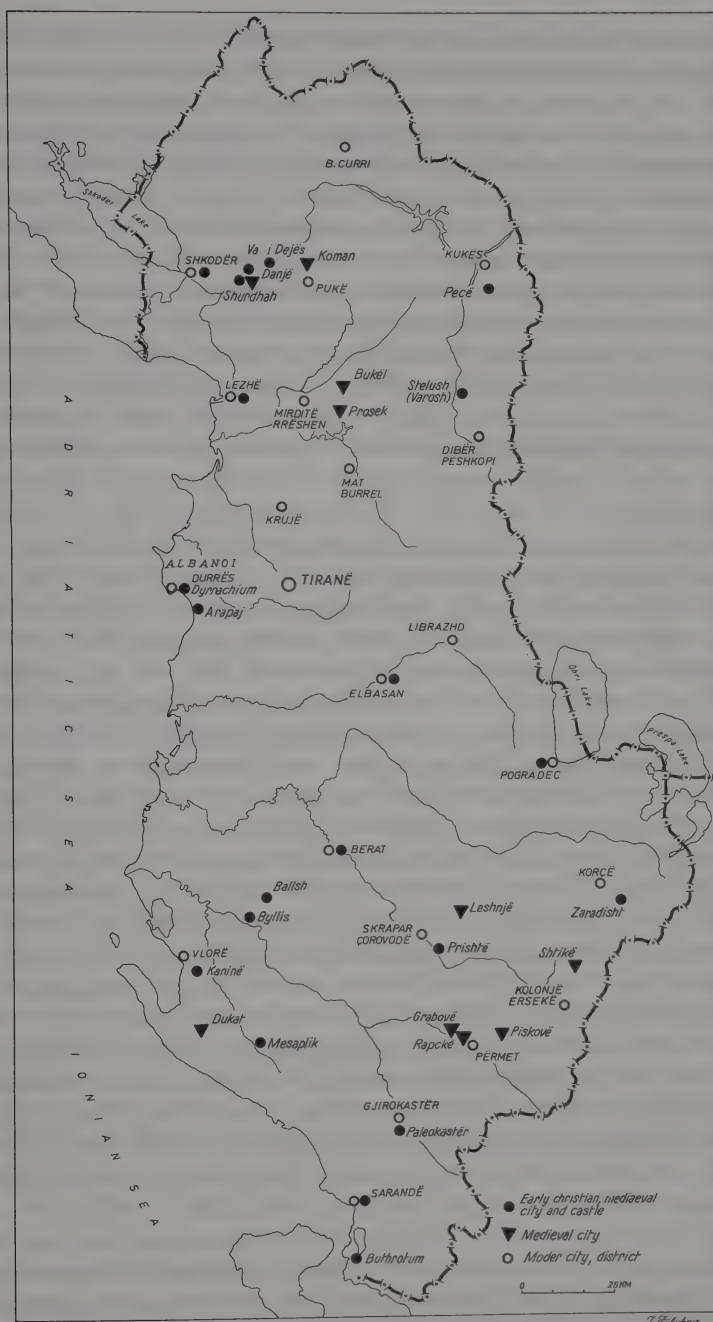


Fig. 3 Early Christian and Medieval cities and sites in Albania.

H. Spahiu (Andrea, 1983–4: 104) and in 1984 (*Iliria* 1984/2: 272–4). From 1965 to 1970 excavations were carried out at Shurdhah (Shkodër) by D. Komata (1967) and Shtikë (Kolonjë) in 1969 (1969: 119–26) where 40 graves were dated to the tenth and eleventh centuries AD. In 1971 surveys were carried out at Bukël (Mirditë) by S. Anamali and D. Komata (Anamali, 1971) and the cemetery of Leshnjë (Skrapar district) by L. Ylli. In 1973 while excavating the tumulus necropolis of Dukat (Vlorë district) graves belonging to late antiquity and the medieval period were also found by N. Ceka (Andrea, 1983–4: 116). In 1984 excavations were carried out by N. Bodinaku in Rapckë and Grabovë (Përmet district) (*Iliria* 1984/2: 277–8) in order to clarify the early medieval remains discovered from 1978 to 1979 in the tumuli of Piskovë, Rapckë and Grabovë. From the survey made in Rapckë over 30 m, 6 cist graves were found with poor grave goods. The excavations in Grabovë brought to light a medieval cemetery where 38 graves were opened. In 1986, 42 graves were excavated in Prosek (Mirditë district) by N. Doda (*Iliria* 1986/2: 272–3) and the material found was similar to that excavated at Koman, Shurdhah and Krujë which are dated to the sixth to eighth centuries AD.

b) Cities and castles

Excavations and surveys have also been carried out on medieval cities and castles.

Among the first castles to be excavated was Varosh (Stelush) in the Diber district by S. Anamali, H. Spahiu and D. Komata, and Shurdhah (Shkodër district) by H. Spahiu and D. Komata in 1968 (1968, 1969) and 1970 (1971). In 1969, and from 1970 to 1971 excavations were carried out at Pogradec by S. Anamali (1969: 89–101, 1971) and in 1973 (Andrea, 1983–4: 112). Excavations were also undertaken at Berat by H. Spahiu from 1973 to 1975, and in 1978 (*ibid.* 111) in the fortress of Prishtë (Skrapar district) by L. Ylli from 1973 to 1975 (*ibid.* 112); in the fortress of Kaninë in the Vlorë district in 1973, 1975 and 1977 by D. Komata (*ibid.* 116); in Lezhë in 1973, 1977 and 1980 to 1983 by F. Prendi (*ibid.* 105).

The palaeo-Christian basilica in the village of Arapaj (Durrës) was excavated by S. Hidri in 1974, and from 1980 to 1983 (*ibid.* 108); the fortress of Paleokastër by A. Baçe from 1974 to 1975 (Gjirokastrë) (*ibid.* 118); from 1975 to 1976, 1978 and 1983 the Christian basilica of the medieval centre of Ballsh in the Fier district (*ibid.* 110); from 1978 to 1979, 1984, and from 1987 to 1990 the city of Shkodër by S. Anamali and H. Spahiu (*ibid.* 104) and B. Lahi and G. Hoxha (*Iliria* 1984/2: 269–70); from 1979 to 1981 the fortress of Krujë by D. Komata (*ibid.* 107); in 1979 the palaeo-Christian basilica of Mesaplik (Vlorë) by D. Komata and P. Kulla (*ibid.* 116); from 1979 to 1980 and 1983 the Christian basilica of Sarandë by K. Lako (*ibid.* 118), from 1984 and from 1986 to 1990 three basilicas and the surrounding wall of Byllis by N. Ceka (*Iliria* 1984/2: 270–1, 1986/2: 270–1, 1987/2: 260, 1988/2: 271); in 1984, 1986 and 1987 the medieval city of Danjë (Va i Dejës in the Shkodër district) by G. Saraçi (*Iliria* 1984/2: 269, 1986/2: 274–5, 1987/2: 266–7); from 1986 to 1989 on the surrounding wall of the castle of Dyrrachium by A. Hoti (*Iliria* 1986/2: 268–9, 1987/2: 250–1, 1988/2: 271–2, 1989/2: 293–4); from 1986 to 1988 the castle of Zaradisht in the Korçë district by P. Damko (*Iliria* 1986/2: 271–2, 1987/2: 257–8, 1988/2: 269); from 1986 to 1989 the city of Vlorë by D. Komata (*Iliria* 1986/2: 269–70, 1987/2: 258–60, 1988/2: 270–1, 1989/2: 297–8); the castle of Pecë in the Kukës district from 1986 to 1989 by L. Përzhita (*Iliria* 1986/2:

265–6, 1987/2: 255–6, 1988/2: 265–6, 1989/2: 289–91); the castle of Elbasan from 1987 to 1988 by Y. Cerova (*Iliria* 1987/2: 265–6, 1988/2: 273–4); in 1990 in the triple-apsed basilica (*triconcha*) of Buthrotum by K. Lako (*Iliria* 1991/2: 269).

The archaeological material gained through these excavations has made it possible to throw light on the main problem of this period: the transition from an Illyrian to an Arberian (Early Albanian) identity. Very few written documents exist from this period (seventh to eleventh centuries AD). The Illyrians are mentioned for the last time in 601 AD in the Chronicles of Saint Demetrus of Thessaloniki while the Arberian population are recorded for the first time in the central territory previously inhabited by the Illyrians by the Byzantine chronicler Kantahuzen in 1041. This population inherited the name of the tribe of 'Albanoi' in the hinterland of Durrës mentioned by the Alexandrian geographer Ptolemy (second century AD). The lack of historical data has led to various theories about the origins of Arberian nationality. Some support the idea of an Illyrian origin for the medieval Arbëri, a few support a Thracian origin, and some the Albani of the Caucasus. Albanian scholars believe that beside linguistic similarities which testify to an Illyrian–Albanian continuity, the surest testimony is the archaeological material discovered. The culture of the eighth to eleventh centuries inherited a tradition from Late Antiquity, for example, of vessel forms and decoration, tools, ornaments and weapons as well as various aspects of religious culture. This culture was named after the village of Koman where it was first discovered but later excavations uncovered other centres of Arberian culture not only in the mountains such as at Bukel (Mirditë district), but also near main communication points such as Shurdhah (Shkodër district) and Pogradec, or on the coastal plain at Lezhë or Krujë. Later it was discovered at other sites in Southern Albania. The early medieval Arberian period of the seventh to eleventh centuries is characterised by a scarcity of fortified settlements because of the collapse of the cities and the return to a self-sufficient economy; only Dyrrachium and Buthrotum were now proper cities. Other settlements were small castles (fortresses) like that of Pogradec which was about one hectare in size, with mortared stone walls, and a layout that was similar to those of late antiquity. There was a rebirth of urban life in the ninth century AD, such as at Kaninë, Lezhë and Berat. Rural sites were very common, however, and represented the main type of settlement, traceable through cemeteries on mountain slopes or along valleys. The main burial rite consisted of east-west burial with graves in the form of boxes using large stone slabs like those of the Bronze Age. Another inherited element was that of the reuse of the grave by those of the same family. Grave goods usually consisted of personal equipment and ornaments for women and weapons, tools and pottery for men and the material excavated mainly from graves shows that the culture of the medieval Arbëri consisted of influences from Late Antiquity (the most important), as well as an Illyrian and medieval-Byzantine component.

Summary

Frequent excavation in Albania has yielded a rich and invaluable source of archaeological information. Unfortunately, much of the potential of this material has not yet been realised due to a lack of resources, specialist knowledge and isolation from the international community.

Contemporary archaeologists in Albania must not forget to pay tribute to those who investigated the archaeology and antiquities of the past and contributed so greatly to the current state of knowledge. There is a great need to disassociate Albanian archaeology from political influences that have played far too great a role in the past, and this must be maintained in the future. The most essential need, however, must be to begin to look at problems and questions that are being posed by archaeologists in other countries.

Abstract

This paper presents a history of archaeological survey, excavation and research in Albania, as well as an outline of the researchers who have been attracted to the rich archaeological material that it presented from the fifteenth century until the present day. A lack of native archaeologists meant that the first surveys and excavations were undertaken by scholars from abroad. This laid the foundations of Albanian archaeology before the Second World War, often carried out under a government agreement. Under the Communist regime, however, native archaeologists began to examine all the major phases, from prehistoric burials and settlements, Illyrian and Epirot sites, Greek and Roman colonies and culture to the medieval period, particularly burials, cities and castles.

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Ancient Medicine and Anatomical Votives in Italy

by SHEILA GIRARDON*

This article forms part of a Ph.D thesis on Etrusco-Italic votive terracottas in the collections of the British Museum. The collection, partly published by J. Turfa in 1986, includes some of the major anatomical votive types: male and female heads, anatomical models of limbs and internal and external organs (1986: 205–13). The topic of this short study is the relationship between votive religion and ancient medicine. Quite considerable claims have been made for the possibility of interpreting anatomical votives in this light, but it is important to examine these claims sceptically because it is dangerous to have wild speculations becoming established fact.

The Greek epics relate that the knowledge of the healing properties of plants which Askepios had received from Cheiron was applied by those 'excellent physicians' his sons Machaon and Podaleirios during the Trojan War. According to tradition, they transmitted this learning to their descendants, the clan of Asklepiadai, as a sacred heritage.

The Hippocratic writings indicate that the early medical schools conducted within the Asklepieia were very practical in their manner of thought: 'to offer up prayers is no doubt becoming and good, but while praying to the gods a man ought also to use his own exertions' (Hippocrates, *de Hinsomniis*, II. 87; Adams, 1886: I, 29).

Medicine, both in theory and in practice, became more rational with the passage of time, and less dependent on faith and miracle. After the Roman conquest and during the early Christian era the Asklepieia were steadily becoming like modern sanatoria and hospitals.

In Italy, while religious healing was gaining popularity among the citizens of Rome, the germs of more scientific methods of treatment were transplanted by many Greek physicians from Knidos, Cos and Alexandria, who, in spite of the diffidence of some Romans like Cato the Elder (Pliny, *N.H.* XXIX. 7. 14; Plutarch, *Parallel lives*, Cato Maior, XXIII. 3–4) came in increasing numbers, many gaining respect and influence. It was during the mid-to-late Republican period that empirical medicine was introduced into central Italy. According to tradition the first Greek doctor to settle in Rome was Archagathus of Sparta in 219 BC (Pliny, *N.H.* XXIX. vi). Or rather, he was the first to be appointed as a civic doctor in the Hellenistic tradition, as Greek physicians were certainly already in Rome by that date.

The majority of educated Romans preferred this kind of medical treatment, carried out in surgeries called *medicinae* or *pharmacopolae* (Lanciani, 1970: 95), to the religious healing of

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the temples, which they regarded with scepticism and scorn, as being too plebeian. This widespread mistrust toward religious healing among the upper class citizens of Rome is illustrated by several remarks of Cicero, in particular: 'I believe that those who recover from illness are more indebted to the care of Hippocrates than to the power of Aesculapius' (Cicero, *de Natura Deorum*, III. 38).

Nonetheless healing sanctuaries and shrines flourished in Republican Italy, frequented mostly by the Italic people who worshipped ancient local gods of agriculture and fertility, but also a multitude of smaller divinities singled out for specific functions connected with marriage, conception, gestation, birth and the rearing of children. To those divinities who supervised and protected every aspect of daily life, as well as to the major gods and goddesses, the anatomical votives were dedicated in great numbers. The most commonly represented parts of the human anatomy were: male and female torsos and chests (sometimes open to show the viscera), heads and half heads, eyes, ears, noses, tongues, breasts, full limbs, hands, arms, feet, buttocks, male and female genital organs (internal and external), and organs such as hearts and intestines (Stieda, 1901: 63 ff.; Capparoni, 1927: 44 ff.).

In Crete, as early as the first Palace phase, reproductions of parts of the human anatomy, clearly intended as votives, were found at the sanctuaries of Petsofà near Palekastro and Kalo Chorio (Myres, 1902-3; Platon, 1958). Small ears, eyes and feet in gold, silver and ivory were found in a rich deposit at the Artemision in Ephesus (Hogarth, 1908: 107-8, 196). In the sanctuaries of Asklepios and other healing divinities, anatomical ex-votos are frequently present. They were found in the Asklepieia in Athens—including the famous votive relief in pentalic marble of a leg on which there is a thick varicose vein (Tabanelli, 1962: 2; van Stratten, 1981: 113, no. 2. 1, fig. 52). Epidauros, Corinth, Cos, Pergamon, Delos etc. have all yielded similar finds (De Weale, 1933; Deonna, 1938; Broneer, 1947: 247; Roebuck, 1951: 111 ff.; De Luca, 1968: 171-2). Other interesting anatomical votive offers from Greece including a brain, terracotta breasts, and male genitals showing pronounced phimosis have been found in Corinth, and tablets with a womb in Cos (Holländer, 1912: 215 ff.; Major, 1954: 110, 116-17). Others have been found in Cyprus (Caubet and Helly, 1971), and examples showing pathological peculiarities have even been found in Gaul (Bernard, 1958; Grenier, 1960; Lebel, 1962).

In the Greek world the anatomical votives are generally made of marble or metal; the terracotta examples from Corinth—mostly heads, eyes, ears, tongues, torsos, hands and arms, legs and feet, and male genitalia of late fifth- to late fourth-centuries date—are an exception (Roebuck, 1951: 113). Their similarity to the Italic examples is remarkable, offering the best parallel in Greece for a practice that had become widespread in Italy.

The Etruscans were reputed to be excellent physicians and some ex-votos from Tossennano near Vulci are considered the oldest known representations of internal organs (Tabanelli, 1962: 51). In Italy anatomical votives have been retrieved in huge numbers, mostly in western central areas, dated between the fourth and the first centuries BC (Fenelli, 1975a: 233-45, fig. 1). The great popularity of anatomical votives in Italy could in part be explained by the lack of a longstanding tradition of professional medicine as in Greece (Edelstein, 1945: 1-64). Only the upper stratum of society had access to an expensive Greek doctor. The rest had

to put their faith in the nearest healing divinity for every sort of cure, turning every village shrine into something of a clinic.

The practice of dedicating anatomical ex-votos declined abruptly towards the end of the second century BC, and by the end of the Republic had almost totally disappeared. At Veii the deposit at Campetti was sealed by c. 50 BC; at the temple of Minerva Medica in Rome and at Capua there is nothing that can be dated later than the first part of the first century BC (Bonghi Jovino, 1965: 23; Torelli and Pohl, 1973: 40 ff.; Gatti Lo Guzzo, 1978: 150–1). The causes for the decline of such a popular tradition are not clear. However, it is possible that the improving standard of medical science may have been at the root of it.

The practice survived in the provinces, particularly Gaul and Britain, where a number of sanctuaries have yielded anatomical votives, mostly in bronze, some in wood, and rarely in terracotta (Martin, 1965; Vatin, 1969; Poursat, 1973; Horne and King, 1980; Henig, 1985: 145).

Of course the practice never really disappeared, but was translated into Christian religion where it still survives in the shape of the miniature ex-votos that decorate the walls of churches in many parts of the world, more interestingly for this study, in central and southern Italy.

After many decades of neglect much attention has in recent years been directed towards the anatomical *donaria* by archaeologists and medical historians. A rather simplistic evaluation was offered by Rouse (1902: 210 ff.) according to whom the anatomical votive was simply a reminder to the divinity, either to propitiate or to acknowledge a favour.

The first serious attempt to focus on the subject was made in the 1930s by Pazzini, advancing a magic-homeopathic view of the problem following a study by Frazer (1922). Pazzini and Frazer saw the anatomical ex-voto as a substitution for the diseased part of the body, in exchange for a cure, drawing a connection between the concept of expiation and sin (Pazzini, 1935: 54). This theory was favoured by other scholars (Pugliese Carratelli, 1968). P. Carratelli saw this interpretation as closely linked with the original double function of the healing divinity as bestower of health but also giver of disease (Fenelli, 1975a: 210), but for others this interpretation is too speculative and too far removed from the historical perspective in which the practice of the votive offer is placed in the Italic context (Ferrea and Pinna, 1986: 133).

More to the point is the medical interest arising from the anatomical replicas: do the votives represent healthy or diseased organs? What relationship existed between the medical knowledge of the time and the craftsman's products, or between religion and medical cures? What was the link between the geophysical characteristics of the site of the sanctuary (springs and healing waters etc.) and the range of anatomical types present?

In some cases speculation on the subject can get out of hand and some enthusiastic assumptions made about the level of anatomical knowledge of the Etruscans are interesting but conjectural. I am referring in particular to a study by Decouflé (1964: 36–7) where the author made the distinction, without offering any proof, between *ex-voto segmentaires*, or isolated anatomical parts, and *mannequines d'ensembles*, or open whole trunks exposing the

viscera. Decouflé claimed that the first were offered by people of low social standing and were mass produced. The second were offered by a better and more educated class of people, showed an advanced knowledge of human anatomy and were expressly commissioned. He also claimed that the more detailed anatomical replicas were used as teaching aids in medical schools near the sanctuaries.

The evidence for a relationship between medical knowledge and anatomical votives is fragmentary, particularly with regard to the internal organs. Apart from representations of single organs, mostly the uterus and some hearts, conventionally represented but clearly identifiable, other internal organs forming visceral groups are more difficult to recognise. In most cases they are not very realistically rendered in shape, proportions or placement, and only with the open torsos can we be certain that human organs are intended and not animal. Some votives from Bolsena have been identified by Decouflé as human (1964: 27, figs 9, 18), and as animal by Tabanelli (1962: 47, fig. 16), and some from Tessennano have been identified as human by Tabanelli (*ibid.* 50–2) and animal by Serchioni (1959: 143, fig. 4).

On the other hand, there is no way of knowing if the intention of the offerer was indeed to dedicate animal parts and entrails. Just as small models of whole animals were offered, in the place of a too-expensive live animal (*ibid.* 143), it is also possible that, due to inadequate knowledge of human anatomy, if human organs were intended the better known animal parts were represented instead.

The level of anatomical knowledge reached by the populations of Etruria and central Italy in the period in question—from the fourth century BC—is hard to establish on the basis of anatomical votive representations alone (Giacosa, 1898; Alexander, 1905; Lützenkirchen, 1974). It is safe to assume that in most cases the anatomical votives indicated a request to the divinity for healing from the ailment of the limb or organ represented (De Laet and Desittere, 1969: 17) and, given the limited number of representations of diseased organs in proportion to healthy ones, that the indication of the specific disease was of secondary importance to the offer of the organ itself (Fenelli, 1975a: 211–12). It is impossible to know if the models showing apparently healthy organs were intended to illustrate disease, as some pathological conditions cannot be displayed. In some cases the elements indicating the condition could be painted on the object as is occasionally done on modern votives.

The anatomical votives were mass produced to satisfy the requests of many different people, and had to be standardised; it was generally enough to offer a reproduction of the organ or limb in question, only in some cases modified at the request of customers to indicate specific ailments. Moreover the craftsmen manufacturing these objects were not likely to have had too much familiarity with contemporary medicine.

However, a number of these models show very distinct pathological conditions of diverse types: an arm with three large ulcers from Tarquinia (Romanelli, 1948: 216), an elbow and the back of a knee from the deposit of Minerva Medica in Rome showing several festering pustules in relief (Gatti Lo Guzzo, 1978: tav. LII, inv. 2641, 2652) and from the same deposit a female head displaying on the forehead an area of newly re-growing hair (*ibid.* tav. XXXIII, inv. 5411). Other anatomical votives reproducing pathological conditions exist (Holländer,

1912: 286 ff.; Capparoni, 1927: 50 ff.; Mayer Steineg and Sudhoff, 1950: 61, 81, 90, figs 35, 39, 50–1).

The most useful work on anatomical votives has been carried out by Maria Fenelli on the ex-votos of Lavinium (1975a). She emphasises the difference between the use of the terms 'ex-voto' and 'anatomical votive': the word 'ex-voto' suggests the idea of an offer to the divinity in exchange for a favour; the anatomical votive is more specifically the representation of a part of the anatomy, human or animal, offered to the divinity.

Looking at specific anatomical groups from Lavinium, as examined by Fenelli (*ibid.* 215 ff.) several interesting observations can be made.

Feet are often found in large numbers, single or in pairs, and generally no anatomical deformity is indicated. They seem to be more commonly found on rural sanctuaries, patronised by farming communities where injuries to hands and feet must have been frequent and disabling (C. Wells, 1985: 41). Feet models seem to be more numerous than hands, a fact that can perhaps be explained by the difficulty of spontaneous healing on feet (Jackson, 1988: 160). The pathological conditions implied by the votive could be various, from fallen arches to ingrowing toenails, from club foot to arthritic joints (C. Wells, 1985: 43–4).

Ears never show pathological malformities (deafness or other hearing complaints are not graphically representable), and were in most cases illustrated with little care for anatomical accuracy (Fenelli, 1975a: 215, *tav.* XL, 1). An inscription from Piacenza, in northern Italy, describes how L. Callidus Primus presented Minerva with two silver ears in response to a successful cure (*CIL* XI. 1295). In Greece ears were a common ex-voto, often hinting at the willingness of the divinity to listen to the human prayer (Deonna, 1938: 217–20; Roebuck, 1951: 120; De Luca, 1968: *tav.* 62A; van Stratten, 1981: 83, 144, figs 11–12).

Eyes were represented as eyeballs or as the whole eye and lid, and the distinction could reflect a real difference in the disease for which a cure was sought. The isolated eyeball was perhaps intended to indicate vision defects such as myopia, detached retinas, cataracts, glaucoma etc., but the eye-plaque could be indicative of infections and lesions of the eyelids, such as conjunctivitis and trachoma of which inadequate hygienic conditions were a common cause.

Without signs of pathology are also the few examples of buttocks, tongues, mouths, torsos and breasts (Fenelli, 1975a: 216, *tav.* XLI).

Buttocks are a rare type of anatomical ex-voto, and only two examples survive from Lavinium (*ibid.* 216, *tav.* XLIII, 1).

One model of a tongue rendered with anatomical accuracy was present at Lavinium (*ibid.* 216, *tav.* XL, 3). In the votive deposit at Ponte di Nona two models of human tongues were found, one a complete ex-voto with clearly marked uvula and tonsils, indicating that tonsillitis was a recognised complaint and may occasionally have been treated. At Ponte di Nona the model of a mouth was also found with clearly marked lips and teeth, suggesting to the excavators possible dental problems (Potter, 1985: 31).

Breasts were a common *donaria* in many votive deposits in Italy and Greece, but at Lavinium only five survived, characterised by distinct nipples. This kind of offering, generally

life-size, could indicate either a breast disease such as mastitis, or a plea for motherhood or even for milk flow (Decouflé, 1964: 9).

Male genital organs are one of the most commonly represented anatomical *donaria* in Italy and in Greece (Roebuck, 1951: 123). At Lavinium they are numerous, and fully and realistically represented; in some cases children's members were intended (Fenelli, 1975a: 216–18, 1975b: tav. XL, 4, 5, 6). Many examples show clear evidence of phimosis, or have the gland completely covered so as to look phimotic (ibid. tav. XL); this condition is also typical of male genital organs from other deposits (Sambon, 1895: 9; Major, 1954: 110, 208, no. 7; Tabanelli, 1962: 11; Furfaro, 1963: 197 (five examples in the Museo Civico in Bologna); Decouflé, 1964: 7; Garofano Venosta, 1966: 16 (examples from Capua); De Laet and Desittere, 1969: 22, no. 15, tav. V, 1 (examples from Palestrina)), and was probably also present in votive deposits reported in older publications where the male genital organs were simply listed but not described or photographed.

Phimosis is a condition induced by lack of hygiene and sexually-transmitted disease such as gonococcal disease; therefore it is feasible to assume that the representations of the male genital organs reflected a real problem. Venereal disease was probably more common amongst urban populations than amongst farming communities, as the proportion of ex-votos representing genital organs in deposits of urban sanctuaries such as Veii, compared to those of rural shrines such as Ponte di Nona seem to suggest (Potter, 1985: 39; C. Wells, 1985: 43). In this case it is possible that in presenting the healing deity with an accurate reproduction of the ailment, the dedicant was requesting a specific cure for a specific affliction. It has been claimed that the phimotic look of the votives may be simply due to the conventional representation of the organ (Holländer, 1912: 312 ff.). Fenelli rightly argues that it is unlikely that these ex-votos were intended to represent healthy organs, as healthy male genitalia are not difficult to represent, unlike some internal organs, and indeed many healthy looking examples exist. The phimotic condition is often so accurately displayed as to leave little doubt as to its interpretation (1975a: 217–18).

Representations of female genital organs can be external (Fenelli, 1975b: tav. XL. 7, XL. 8; Torelli and Pohl, 1973: 242–4, figs 119–20) or internal. The internal uteri are the more frequent, probably one of the most common ex-votos in the Italic world, found in hundreds at Poseidonia (Sestieri, 1955: 39). This organ was represented with a mixture of anatomical accuracy and inventiveness. The muscular part of the organ was generally indicated by ridges, at times undulated, the model generally terminating at one end with an oval or circular opening; occasionally an elongated appendix on either side of the uterus has been interpreted as the ovary and the Fallopian tubes (Curatolo, 1901: 90, fig. 26; Holländer, 1912: 192–3; Rouquette, 1911–12: 270–87, 370–414; Tabanelli, 1962: 74, nos 6, 7, 8; Fenelli, 1975a: 220) or as a vaginal cist (G. Wells, 1964: 267, no. 34).

The first known studies of embryology and biology are attributed to Alcmaeon of Croton in the sixth century BC (Sigerist, 1961: 101–3, nos 55–9, 287–90; Pazzini, 1963: 2 ff.); in the *Corpus Hippocraticum* gynaecology and the anatomy of the female reproductive organ were reasonably, if partially, understood (Sigerist, 1961: 260 ff.; Radicchi, 1970: 44–58). Already in the second half of the fourth century BC the anatomy of the female genital organ was well

known and studied by Diocles of Carystus (Willman, 1901), Praxagoras of Cos (Steckerl, 1958) and Erophilos (Celsus, *De. med.* 23–4; Galen of Pergamum, *de dissect. uteri* IV; La Torre, 1917: 119 ff.). However, it is doubtful that this medical knowledge was available to the craftsmen modelling the anatomical votives. It is more likely that the artisan manufactured an object corresponding to the traditional idea, held by himself and by his customers, of the organ. This could explain a certain ‘artistic’ freedom of representation that has puzzled scholars for decades.

In her study, Maria Fenelli has emphasised the problem of interpreting the significance of this group of *donaria* in relation to the various characteristics represented (1975a: 223–4). Most notably: is the uterus (particularly when rendered with the neck wide and open) intended to indicate a pregnant woman approaching birth and making the offer for propitiatory reasons (Sambon, 1895: 9; Tabanelli, 1962: 73)? Or was this way of illustrating the organ merely conventional and without any significant anatomical relevance? In this case the offer can be interpreted merely as a plea to the divinity for fertility (Thomasson, 1961: 137). We must not forget that venereal gonorrhoea was also a common disease amongst women, causing pelvic abscesses and eventually sterility due to the blocking of the Fallopian tubes (C. Wells, 1985: 43).

The models showing lateral appendices can also suggest different intentions on the part of the donor according to the interpretation given as ovary or cist. As a cist the addition to the organ suggests an obvious healing connotation (either as a request or thanksgiving) but as an ovary the fertility implication is evident. The case for the ovary can be further complicated by the theory concerning the sex of the foetus. According to ancient medical belief, still credited until the Renaissance, the female foetus was conceived in the left side of the uterus, the male in the right side. The presence of a right or left ovary in the model of an uterus may imply a request for a male or female child. (For the ancient theory on sex: Censorinus, *De die natali* VI. 6–8, Galen, *De semine* II. 5; Galen, *De usu partium* XIV. 6–7; Nardi, 1938.)

The heads are commonly interpreted as a generic offering representing the donor. This must have been so in many cases. However, other possibilities should not be discarded, as Calvin Wells so eloquently postulated for the votive deposit at Ponte di Nona (1985: 41–4). Headache is one of the most common symptoms of a number of ailments; particularly relevant is malaria—a disease that caused much misery amongst the populations of areas of central Italy until the early part of this century. Fever and headache are typical of cerebral malaria, and can cause much suffering and ultimately death. The second ailment is migraine, then as now a debilitating condition. An interesting characteristic of the headaches caused by migraines, is that they often occur only on one side of the head; thus the etymology of the word—*hemicrania*, which could account in some cases for the half-heads so common in most votive deposits.

Other diseases not graphically representable, such as arthritis, may have been at the origin of some anatomical dedications. This infirmity attacks the spine, the knees, hands or feet; and paleopathological evidence from the excavation of cemeteries has demonstrated that most ancient communities suffered from some form of osteoarthritis (ibid. 42).

Skin diseases are also difficult to interpret. Nevertheless, we must assume that they were

widespread. Many of the ex-votos representing hands, feet, limbs, heads etc., may be attributable to ailments such as scabies, psoriasis, allergic rashes, lesions or fungal infections, acne, ulcers, warts—indeed the list of possibilities is almost limitless. Poor living conditions, the lack of hygienic practice and ignorance of germ transmission must have been conducive to a high level of dermatological disease and infestation. Unless this is borne in mind there is little or nothing in the appearance of the ex-votos themselves to hint that the part of the body represented may have been afflicted by such complaints.

The medical evidence offered by the anatomical ex-votos is unfortunately rather limited, and although several interpretations can plausibly be put forward for the use of individual organs or limbs, at this stage of research none can be proved with certainty.

In conclusion, we can assert that votive religion in general shows an optimistic faith in the gods' power and will to cure. Here lay the difference between Greece and Italy: it was not that the Greeks valued health less than the Italic people, but they put less trust in religion, in spite of the spread of the cult of Asklepios. It was the difference between a culture with a long tradition of professional medicine and one without. Moreover Greek religion required from its healing divinities high status and omnipotence; Italic religion was willing to put its faith, for every sort of cure, in the nearest shrine, of town or village, and in almost any god or goddess, especially one who was already trusted for help with childbirth and child care.

Abstract

The topic of the article is the relationship between votive religion and ancient medicine in Republican Italy. Anatomical votives were dedicated in great numbers at healing sanctuaries, mostly models of limbs, organs and heads. In most cases the anatomical votives indicated a request to the divinity for healing from an ailment to the limb or organ in question. Some of these objects, for example the male genital organs, present signs of a pathological condition, but the majority appear to be healthy and conventionally represented, particularly the internal organs. The article examines the types of anatomical votives from major deposits in central Italy, particularly Lavinium, and suggests some possible ailments and diseases hinted at by their appearance or frequency, regardless of the scanty medical evidence offered by the objects themselves.

Bibliographical notes

The earliest study on the subject was by G.F. Tomasini, dated 1654 and re-published in 1699.

Between 1881 and 1890 the Tiber river bed was drained and its banks re-aligned. This resulted in the recovery of great quantities of anatomical votives, which sparked a new interest in this class of objects (Pensabene, 1980: 5–15). Particularly significant were the works in the area of the *isola Tiberina*, seat of the temple of Aesculapius. A vast quantity of the material was dispersed, removed by the labourers and sold to local antiquarians, and the bulk of it went to large museums and private collectors in Europe and America. Some of the votives were acquired by the British doctor, L. Sambon, who published a description of them

in the *Donaria of Medical Interest* in 1895. L. Stieda was the first to tackle the subject applying archaeological method (1901).

The numerous excavations of sanctuaries and cult sites this century have yielded large quantities of anatomical votives retrieved and recorded in their proper contexts. The excavation reports of some of the most significant sites offer valuable information on the subject. A specific general study of the problems concerning the anatomical votives, heads excluded, is still needed. The best attempt so far is the study of the material from the deposit at Lavinium by Fenelli. The bibliography at the end of her article is full and comprehensive (up to 1975).

The following bibliography, in addition to the titles already referred to in the text, gives some of the most significant works listed by Fenelli with an up-date, considering only publications including anatomical models of limbs and organs (therefore intentionally omitting some major works dealing mainly with terracotta votive heads and figurines).

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The Romanisation of the *Civitas Vangionum*

by RALPH HÄUSSLER*

INTRODUCTION

With the arrival of the Romans in Northern Gaul, the effects of Romanisation can almost immediately be detected in what was to become the Northern Provinces which include the territory of the *Vangiones* under consideration here. The typical remains of Roman culture—well known from the Mediterranean world—now appear in large quantities; for example, we find Latin epigraphy and Roman-style pottery, especially terra sigillata, and also roads, and architecture incorporating Roman building techniques. The few typical artefacts of pre-Roman culture are often dated to pre-Roman times (i.e. La Tène D2¹) because of difficulties of dating non-Romanized sites into the Roman period. In addition, there seem to be hardly any archaeological contexts where La Tène and Roman artefacts are found together.²

Only in certain periods of German historiography,³ when a German(ic) omnipresence was being stressed for nationalistic reasons, was the Roman era described as a time of occupation with an emphasis on the continuity and resistance of the Germanic tribes. Hence, F.M. Illert's modest statement in the guide to the Worms Archaeological Museum:⁴

Wenn es auch scheint, als ob der Vangione völlig zum Römer geworden wäre und als ob die stolze Haltung des römischen Reiters, zu dessen Füßen die Gestalt des besiegten Germanen kauert...der eigentliche Ausdruck des endgültigen Sieges der Römer sei, so war diese Zeit doch schließlich nur ein Durchgang durch die übermächtige Gewalt und Herrlichkeit des Weltreiches.

In concluding he suggests that this period presented the Germanic tribes with the possibility of making themselves lords over that Empire:

Wir tun gut daran, sie nicht als einen Irrweg oder gar als Schuld zu verleugnen, sondern als Schicksal zu bejahen, weil sie letzten Endes die ungeheuren Kräfte weckte, die die germanischen Stämme befähigten, sich selbst zum Herrn dieses Weltreichs zu machen.

Even this ideological approach, quick to discover 'resistance' in any pre-Roman survival, does not manage to describe the 'acculturation' processes at work in indigenous and Roman culture.

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There was neither resistance to Rome, nor instant Romanisation. Roman imperialism amounted to rule through local élites since the Roman 'state' did not possess the logistics for direct rule.⁵ Hence the success of Roman imperialism. No direct intervention in the native societies was embarked upon, except where such societies challenged the Roman authorities, peace or the social order. Rome rarely forced peoples to change their way of life or to accept the Latin language or deities. Initially, the major *indirect*⁶ impact on the society was of a primarily military kind, beginning some forty years after Caesar's conquest with the end of the Civil Wars and the reconsolidation of the Roman Empire under Augustus. A large number of Roman soldiers were then advanced into the Rhine area to secure territory, and these continued to advance into free *Germania* as can be seen by the various campaigns of Drusus and his successors.

Consequently, the contact between the indigenous population of the later *civitas Vangionum* and the Romans would have been minimal, and was probably confined to the local aristocracy who worked together with the Roman administration; and to those fighting as Roman auxiliaries.⁷ The majority of locals may have been unaffected by Roman conquest for several decades, especially those in the countryside; Celtic *oppida* like the Titelberg had their heyday after the Gallic War,⁸ although they declined rapidly thereafter.

This work sets out to describe the effect of the Roman conquest and the subsequent integration of the *Vangiones* into the Roman Empire. This integration was comprised of processes of interaction between the two cultures, which had an impact on the local economy, epigraphy, technology, culture, religion, and so on.⁹ Changes in material culture are seen as a reflection of social and political changes taking place during the first centuries of Roman rule. Concentrating on one *civitas* only allows for detailed studies of, for example, the development of the regional settlement pattern or the epigraphic habit.

Several problems require consideration. One, of a general kind, is the state of publication of the archaeological record, which is scattered, out of date, dependent on political borders, and usually not concerned with the problematic nature of 'Romanisation'. Furthermore, there are problems with dating, even for major architectural structures (like villas, *basilicae*, etc.), and the fine dating necessary for work on the transition period from La Tène to Roman times is not available. This is particularly obvious in the publication of the coinage of this area in *Fundmünzen* (FMRD). A haphazard recording of coin-finds hinders statistical analysis.

In Quest of the Vangiones

It is uncertain whether the *Vangiones* were a Celtic or Germanic people—if indeed, this division can be made at all. While the literary sources describe them as Germanic,¹⁰ the material evidence and epigraphy indicate that they were a Celtic people.

Stümpel notes a possible division of the later *civitas* into two distinct cultural groups around the eve of the Roman conquest.¹¹ In the north-east, rough handmade pottery and urn-burials dominate, giving way towards the south and the west, including *Borbetomagus*, to an indubitably Celtic culture with painted late La Tène wheel-thrown pottery and cremations (*Leichenbrand*), aspects which can be found in the north-east only rarely. If one agrees on the

concept of two culturally different areas,¹² then it appears that, while the south-west was Celtic and probably populated by either *Mediomatrici* or *Treveri*,¹³ the culture of the north-east was more likely to be Germanic and therefore Vangionic; a hypothetical process of 'Celticisation' is needed to explain the atypical 'Germanic' culture in the north-east. This causes another problem for Stümpel's hypothesis because the later capital of his 'Germanic' *civitas Vangionum* was—at that time—the 'Celtic'-dominated city *Borbetomagus*; a puzzle he solved by assuming a further, peaceful movement of the 'Vangiones' southwards before the creation of the *civitas* by the Romans. And yet, it is striking that his 'Vangionic' territory became the military district of *Mogontiacum*, while his 'Celtic' regions in the south and west the *civitas Vangionum*.

Recently, the Germanic origin of the *Vangiones* has been questioned, owing to the typically Celtic nature of the material evidence.¹⁴ The dubious literary evidence on ethnic origin can be ignored, for example, the statement 'ipsam Rheni ripam haud dubie Germanorum populi colunt, Vangiones Triboci Nemetes'¹⁵ of Tacitus who tells that even the *Treveri*—for us a Celtic people—claimed a Germanic origin. The modern division between Celtic and Germanic derives from the material evidence; the comments of ancient authors were presumably based on political or ethnological concepts. The name *Vangiones*, as pointed out by Bannert,¹⁶ could derive either from the Germanic *wanga* or the old-Celtic *vanga*.¹⁷ The Celtic origin of the neighbouring *Nemetes* and *Triboci* has been proved in the meantime.¹⁸

Due to the supposed Germanic origin of the *Vangiones*, held until recently, severe problems of interpretation have been raised. The greatest concern has been to find a suitable date for this 'Germanic' tribe's crossing of the Rhine. Speculations have ranged from the time before Caesar under Ariovist,¹⁹ up to the middle of the first century AD since it is argued that Caesar had not allowed 'Germanic' tribes to settle on the left bank.²⁰ Two questions arose from such an extrapolation. Firstly, where did the *Vangiones* come from? Schmidt²¹ suggests the Wetterau (for an East-Germanic or Suebian origin see Nierhaus who convincingly proves that it should be rejected²²). Secondly, there is the question of which peoples previously inhabited the region. Despite the traditional view (*Treveri*²³), the *Mediomatrici* seem the most likely choice. This debate was used to disregard the archaeological evidence. Hommel wrote, for example, that 'despite of prevailing Celtic commodities, one should not conclude that the population of these territories was in the first centuries of our era substantially Celtic. Instead, as is natural, Celts (who still lived here) and left-bank workshops delivered the Germanic newcomers.'²⁴ This style of free re-interpretation resulted occasionally in rather obscure statements, for example Nierhaus's comment on the absence of Germanic names on inscriptions in *Germania Superior*, and that we find only 'gallo-römische Namensformen, die über das Namensgut ihrer Träger gar nichts aussagen. Von Germanentum keine Spur mehr!'²⁵ The obvious solution is that the population was not Germanic at all. We should therefore reject several former interpretations and I will refer to this, at the very least Celticised people as the *Vangiones*, Celts or Gauls operative within a wider Gallic and Celtic cultural background.

The territory of the *civitas Vangionum* cannot be determined precisely. As can be seen from Fig. 1, I take into consideration roughly the territory of the later bishopric of Worms as far as

the river Glan in the west and the river Rhine to the east²⁶ (*civitates* becoming bishoprics with Christianity), together with all of Rheinhessen;²⁷ but I exclude the military post *Mogontiacum* because it was not a part of the administrative unit of the *civitas*²⁸ and because its material culture was strongly influenced by the army.

THE FIRST ONE HUNDRED YEARS

In the first decades of Roman occupation, Roman influence came primarily from the army, an army which had probably moved from inner Gaul to the Rhine in preparation for Drusus' campaigns against free *Germania* after 20 BC. Previously, the defeated and allied Gallic peoples,²⁹ left alone by Caesar, remained pacific. Rome was far away and disrupted by civil war,³⁰ while the peace in Gaul made an economic recovery in the region possible. This peace was needed as the enormous and excessive battles of the Gallic War must have had a disastrous effect on the Gallic economy for decades.³¹ Trade with Rome could now be extended. Roman merchants are attested at a very early date even on the (non-Roman) right bank of the Rhine, where some of them were killed, forcing the governor Marcus Vinicius to interfere in 25 BC.³²

With Augustus, a man came into power who wanted a reorganisation of the Roman Empire. This intention also affected the land along the Rhine which now became a military deployment area. The Emperor Augustus stayed in the region from 16 to 13 BC. When he left, seven legions were stationed along the Rhine, two of them on Vangionic territory in *Mogontiacum*; in some periods, up to twenty-four thousand legionaries plus various *auxilia* units had to live off the land of the *Vangiones*.³³ Some of the legions also remained for some time in *Borbetomagus* or had detachments there.³⁴

This was perhaps the time when the inhabitants of the later *civitas Vangionum* felt the presence of Rome in the form of road-building, occupation of land, and through requisitions of timber and food for the army, since this number of legionaries (as many as based in the whole of Britain) would have consumed about two hundred and sixty-five thousand bushels of wheat every year.³⁵

The land was now owned by Rome, as was common in *civitates peregrinae*, though leased to the former owners who now had to pay rent.³⁶ Furthermore, troops under the command of native nobles, and organized after the pattern of Roman *auxilia* units, had to be supplied by the various tribes, i.e. as non-Roman citizens the people were forcibly conscripted, and not paid by Rome.³⁷ For the *Vangiones* a *Cohors I Vangionum milliaria equitata* is attested.³⁸ Around the year AD 50, *Vangiones*, together with an *auxilia* unit of the neighbouring *Nemetes*, had to fight against the invading *Chatti*; for their victory the Roman general in Mainz received triumphal insignia.

Realising that they were no longer masters in their own country, Celtic *nobiles* organised an open rebellion against Roman rule. Already in AD 21, the neighbouring *Treveri* had rebelled against excessive taxes and tribute, but they could allow themselves to be more subversive since there were no legions based in their territory, while the *Vangiones* had to live with from

two to four Roman legions, whilst having an enemy (the *Chatti*) on the other side of the Rhine—a fact which might explain their action in the Batavian revolt.

The Batavian revolt began in AD 69 in *Germania Inferior*, then expanded to the *Treveri* and *Lingones* who fought for an independent Gallic kingdom,³⁹ and ended between Mainz and Worms where the Treverian Tutor, supported by *Vangiones* and *Triboci*, fought against the 22nd legion. Faced by the prospect of battle with a Roman legion, the *Vangiones* and *Nemetes* deserted and eventually the rebels lost. The Treverian commanders Tutor and Cranicus are said to have emigrated, together with 113 councillors, into so-called 'free Germany', which probably amounted to the complete loss of the tribal aristocracy for the *Treveri*.⁴⁰

Resistance against the Romans failed. After the Batavian revolt, national *auxilia* units were no longer under local command,⁴¹ and in addition local troops were moved around, in order to destroy the relationship between the soldiers and their regions. Some years later, the part-mounted Vangion-cohort mentioned above would be found at Hadrian's Wall.⁴²

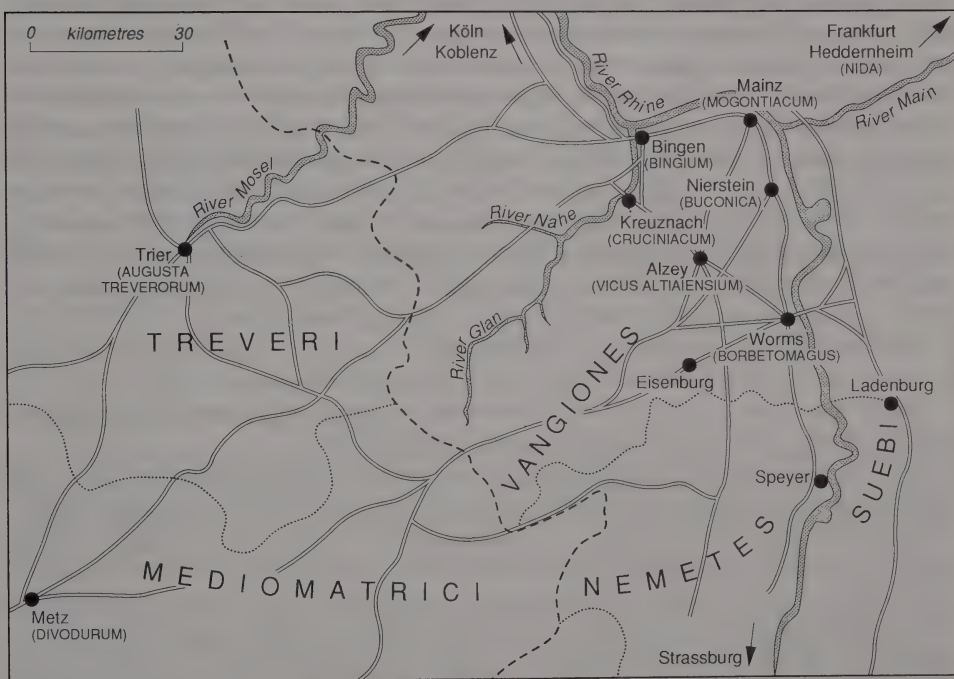


Fig. 1 The assumed territory of the *civitas Vangionum*, based on Bannert (1978), Cüppers (1990), Zangemeister (1905), *CIL* XIII, 178, Bernhard (1979), including the neighbouring peoples, some major sites and Roman roads.

The province *Germania Superior* was created at the end of the first century AD. The name *Germania* was taken, although most of the population (like the *Helvetii* or *Sequani*) were undoubtedly Gauls. This action effectively separated inner Gaul from a military deployment zone, from where a conquest of the Germanic territories beyond the Rhine could be launched.

Probably from this time on, the territory of the *Vangiones* was organized with a self-governing body and constitution in a Roman pattern. While the pre-Roman society of the *Vangiones* did not seem to know 'towns' as administrative centres,⁴³ from now on the society was to be organized principally like a *polis* or *civitas* consisting of a city, *Borbetomagus*, together with its territory. This effected a break with traditional tribal organization.

From this time on, the leadership of the *civitas* seems to have consisted of annually elected *duoviri iure dicundo*, assisted by *aediles* and other magistrates, and with the *ordo* as council.⁴⁴ The 'noble *equites*' were converted into *decuriones* (councillors).⁴⁵

For the *civitas Vangionum* several councillors are attested: Lucius or Titus Romanus Respectus,⁴⁶ Marcus Adiutorius Memor,⁴⁷ and especially Gaius Lucius Victor who had held all magistracies 'omnibus honoribus functus' and built a (perhaps triumphal) arch for his home-town.⁴⁸ Gaius Candidus Martinus was in charge of the imperial cult as 'IIIIIIlvir Augustali c[orporis] senio[rum]',⁴⁹ and as such was not a *decurion*. We might describe the 'servus arcarius rei p[ublicae] civ[itas] Vang[ionum]' as an unfree civil servant in charge of the city finances. The highest office, that of the *duumvir* ('mayor'), is not attested, but this is very common in many regions. There is no *duumvir* recorded, for example, for the *civitas Ulpia Sueborum Nicretum*, nor for *Mogontiacum*, and there is only a 'IIvir aerarii publici'⁵⁰ for the *Treveri*. The evidence from *Lugdunum* shows clearly that it is simply a matter of epigraphic habit, i.e. inscriptions appear to reflect a certain kind of inter-élite competition, put up by 'social climbers' to show off their newly achieved status, and therefore the most common office attested is that of the *sevir Augustalis*, a typical magistracy for freedmen. A certain stratum in the élite, and obviously those people who were potential *duumviri*, do not seem to have felt a need to record their achievements.⁵¹ In contrast, the known magistracies in the *civitas Vangionum* may be taken as proof for a standard constitution.

Millet regards the establishment of a Roman-style *civitas* as a strengthening of the local élite who became integrated into a system which reinforced their power.⁵²

Nevertheless, it seems a bit far-fetched to interpret the new *ordo* as merely a Roman form clothing an old, native content (i.e. an assembly of Celtic nobles).

If this were so, the *ordo* must presumably begin with an already large number of about 100 councillors,⁵³ with rules for voting and the holding of elections, oaths of magistrates to Jupiter and the emperor, and the recording of decrees in the city archive.⁵⁴ This is quite different from Celtic society which by contrast encompassed three classes, 'classe sacerdotale' consisting of various types of druids, 'classe guerrière' who controlled the land, and the almost unfree 'classe artisanale et productive'.⁵⁵ To the Celts, the druids were superior to the rulers, while for the Romans, the chief magistrates were priests at the same time, creating a unity between religious and political spheres;⁵⁶ a system which was part of the Roman constitution of the *civitas* because imperial cult, *flamines* and *haruspices* were municipal magistrates, like the *sevir Augustalis* mentioned above. The practices of the druids were forbidden in the reigns

of Tiberius and again by Claudius due to rites involving human sacrifice and their presumed 'nationalistic', anti-Roman intentions—and one can only speculate that these same men may later be found as *sevir Augustalis*⁵⁷ or as *doctor artis calculaturae*.⁵⁸

Moreover, it is significant that only administrative functions remained with the *decuriones* with the creation of the *civitas*, now dependent on the provincial governor and on Rome but without real statesmanship;⁵⁹ the last initiative for independence had been punished after the Batavian revolt.

In addition, the *decuriones* were responsible for the collection of *tributum* (taxes).⁶⁰ This was not only a burdensome obligation;⁶¹ *tributum* was also a symbol of subservience, and Roman tax collectors had previously undertaken this work. Hence it must have been a rather unpopular office, made worse by the enormous expenses involved in the post which are stated in 'standard constitutions'⁶² where expenses of at least 2000 sesterces per year needed to be undertaken by magistrates, in addition to their admission fees for becoming a councillor.

In pre-Roman times a system of bondings between aristocrats and clients existed. Constitutional changes reduced the personal power of an aristocrat over his subjects to the duties entailed in public office, and replaced élite competition with discussions in the *curia*. This, together with military recruitment dominated and organized by Rome, at the very least weakened the traditional Celtic relationship between nobleman and client. If some *nobiles* emigrated across the Rhine, as the *Treveri* did after the failed Batavian revolt (see above), the old system of personal bondings would probably have been radically disrupted or destroyed, precipitating a chaotic situation, so that the constitutional reorganisation introduced by the Romans would probably have been welcomed, as it would have allowed Rome-friendly newcomers to gain a high status in the municipal administration without having previously possessed any significant social status within the tribal context.⁶³

From all this one cannot conclude that there was a strengthening of the local élite, as Millett has done, but rather a profound break in social structure in which the members of the élite changed both their environment and the functioning of traditional methods of élite competition.

THE SETTLEMENT PATTERN

Some changes in the settlement pattern are obvious. The typical hill-towns (*oppida*) of Caesar's time declined, Romanised cities and villages along the Roman roads grew, and the countryside became Roman in appearance, with typical Roman *villae* replacing native farmsteads.

The countryside of the *Vangiones* during La Tène D is difficult to assess. A very large number of possible settlements have been recognized which might be described as 'hamlets',⁶⁴ together with a few larger settlements, probably *oppida*, like Bingen, Alzey, Worms, or Donnersberg.

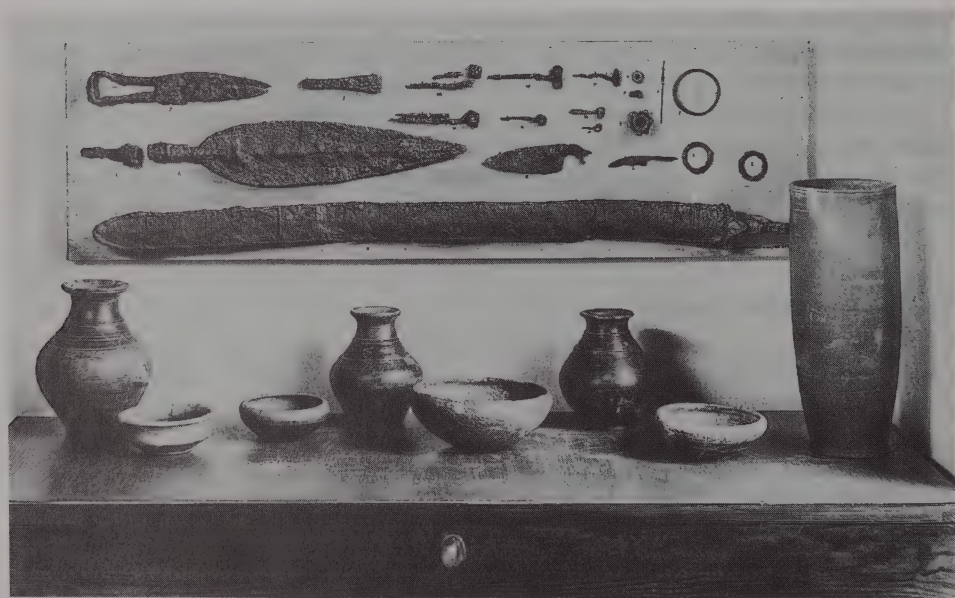
Since this was the society of an equestrian élite, where display of warrior status, or of having trade connections with the Mediterranean world was important,⁶⁵ a distribution map

of the graves of warriors (Pl. 1) or of those containing *amphorae* and other prestigious goods might indicate the homesteads of the Celtic élite, though not of lords or kings as there were no *Fürstengräber* at that time. Figure 2 shows the widespread nature of such finds across the territory suggesting that centralization is unlikely. Even a large settlement like the *oppidum* Donnersberg was just a local 'hill-fort'⁶⁶ and did not function as a capital,⁶⁷ as *Borbetomagus* would by the end of the first century AD, contrary to the traditional pattern.

The decline of hill-towns

Caesar mentions several categories of Celtic settlement which he describes as *oppida* (towns), *vici* (townships), *aedificia* (farmsteads) or *castelli*. The *oppida* Caesar was mostly concerned with were Celtic cities on hilltops, although he mentions other possible locations, for example on plains, protected by rivers at a ford.⁶⁸

The Donnersberg⁶⁹ was one such Celtic *oppidum* in the territory of the *Vangiones*, approximately thirty kilometres west of *Borbetomagus*, on a 687 m high mountain, overlooking the Rhine valley to the east. It covered some two hundred and forty hectares, had typically Celtic late La Tène *Zangentore*,⁷⁰ and contained a *temenos*. The *oppidum* dates to the late La Tène period, except for a much later cross-wall which can be dated more precisely by the presence of Italic amphorae to the middle or third quarter of the first century BC. It seems that 'a further fortification was built here during the, nominally, Roman period'⁷¹ some time after Caesar's conquest.



Pl. 1 La Tène grave goods of a warrior (sword, scissors, lance-blade, etc.) in the Museum of the City of Worms in St Andrews (courtesy of Stadtarchiv Worms).

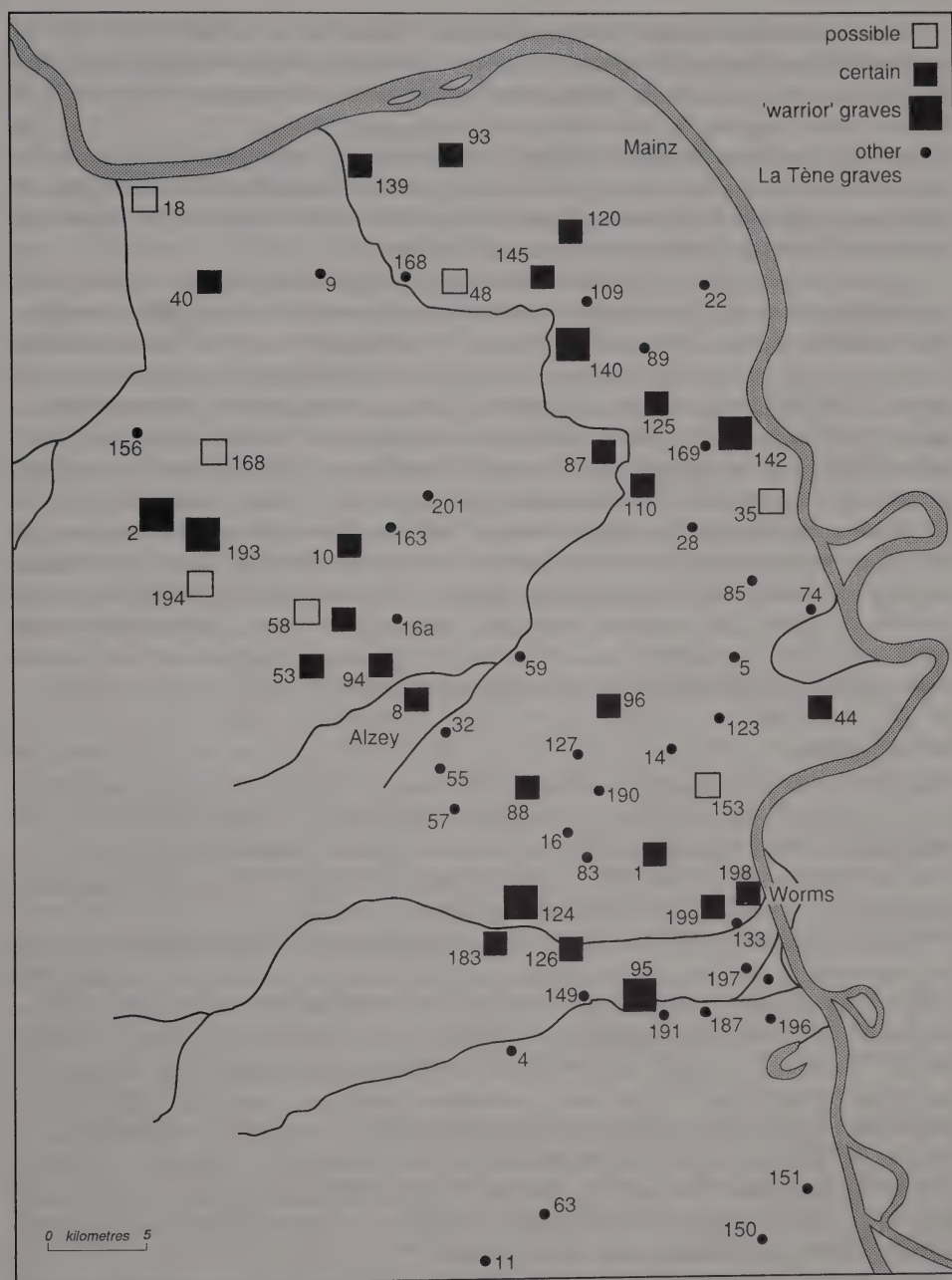


Fig. 2 The distribution of élite graves, either warrior graves, or graves containing amphorae, etc. and of late La Tène cemeteries in general (after Appendix I).

But its days were numbered. There is not a single Roman find to indicate that it survived long into the Roman period,⁷² although it would be re-occupied in the third century.⁷³ Possibly the inhabitants had to settle in another place on the plain, as happened to the people of *Bibracte* whom Augustus ordered to move to *Augustodunum* (Autun).

Despite Millett's statement that 'the forced removal of native towns from hill-tops to new cities on the plain...is exceptional',⁷⁴ we can state that in general, the occupation of many, if not all, such *oppida* declined heavily around the turn of the millennium,⁷⁵ as can be seen, for example, at Titelberg,⁷⁶ Donnersberg,⁷⁷ or Bad Dürkheim.⁷⁸

In a prestige-goods system, the extent of voluntary geographical mobility is unknown. That people should leave their home communities and family holdings because of the advantages of urban infrastructure is less than convincing. Or did people leave their now prospering Titelberg or even Donnersberg where they had just improved the fortifications for the future, because of the newly established *pax Romana*, a peace so insecure that it was not able to prevent the *Chatti* from crossing the Rhine even a century after Caesar? Is it not more likely that migration occurred, as at *Bibracte*, by order of the Romans? May Drusus have depopulated the Celtic strongholds, in an attempt to avoid a war on two fronts, the Celts to the left, the 'Germanic' tribes to the right, or even a coalition between them? Nevertheless, the citizens moved to other towns in the *civitas* which were situated along the newly built Roman roads, towns which now had advantages because of the changing priorities and which therefore developed into important market and administrative centres. One of those cities within sight of the Donnersberg was, and still is, *Borbetomagus*, which seemed now to have grown enormously in comparison to its pre-Roman settlement.

Borbetomagus

Already in pre-Roman times, *Borbetomagus* had been an important place, and probably a Celtic *oppidum*. It was situated at the essential river-crossing on the Rhine, the crossing of through-roads of the continent. In addition, situated on the most southern bank, the town was protected from flooding on the Rhine, and, according to Stümpel,⁷⁹ it was also the approximate site of an important centre of the late La Tène ceramic industry.

The importance of the town's location and the fact that the strongly fortified hill-towns like the Donnersberg (which was, in the dangerous periods before the '*pax Romana*', probably the more important centre) could not be integrated into a Romanised structure led to a clear preference for *Borbetomagus*; initially, as a military garrison, then as a candidate for a *caput civitatis*. There were no other cities of similar importance in the territory. The Donnersberg was by then deserted, and *vici* like Alzey were neither strategically nor economically important, while *Mogontiacum* was a military creation, despite its Celtic name, and without a native predecessor. From its street-grid, *Borbetomagus* does not seem to have been a planned Roman city—a creation for resettling the Celts from the hill areas. Instead, I would rather believe it to have been the uncontrolled development of a native settlement, supported indirectly by the *pax Romana*, trade, and a garrison.

It is difficult to explain what factors caused the inhabitants of sites approximately two miles north and south of *Borbetomagus*, Rheingewann and Adlerberg, both occupied since

the Neolithic, to abandon their homes, though this occurs at approximately the time when *Borbetomagus* shows the beginning of strong occupation, at around the middle of the first century according to the distribution of coins (see Appendix III), *fibulae*, and terra sigillata.⁸⁰

From the beginning of the Roman occupation, *Borbetomagus* was a military post. Until AD 69 eight auxiliary units were based there, plus various legions or detachments.⁸¹ Roman roads led along the Rhine north to Mainz, south to Straßburg, north-west to Bingen, Köln, and Trier, west to Metz, one via Eisenberg, another via Pfeddersheim, and across the Rhine to Ladenburg, to the Wetterau and the Odenwald, and into free Germany.

Because of the lack of evidence, it is difficult to decide whether the army was based here solely because of the town's strategic importance on the Rhine or because of political factors, to oversee the septs of a tribe based here.⁸²

The Roman fort together with the *canabae* around it did not comprise the foundation of the later *caput civitatis*. Instead, the existing native settlement, stimulated by the Roman garrison and a growing market, became an administrative centre, a place of residence for the élite, and eventually a Roman town.⁸³ The town, both administrative centre and garrison, and the 'higher social prestige of the town-dweller'⁸⁴ promoted contact with the Romans, and stimulated the Romanisation of the native élite; urbanisation could be described as 'Motor der Romanisierung der eroberten Gebiete'⁸⁵—the Roman appearance of the towns is one consequence of the process.

As the administrative and religious centre, the capital of the *Vangiones*, *Borbetomagus*, would have been 'nicely' decorated in the following centuries in competition with the neighbouring tribes, as can be seen by the triumphal arch or city-gate, *porta*, built by the decurion Lucius Victor 'ob amorem patri[a]e et civium'.⁸⁶ It was the custom everywhere in the Graeco-Roman world for councillors to spend money on public buildings.

Certain public buildings indicate the city's self-government. The most typical Roman-style import, the *basilica* (now underneath the cathedral of St Peter and St Paul), together with the *forum* and Jupiter-temple, perhaps *capitolium*, constituted the centre of the municipality. Here, the *ordo* met, justice was administered, and Roman state gods were worshipped by the magistrates.

Public baths and a(n amphi)theatre can be assumed. Mediterranean peristyle-houses, other stone-houses with *hypocaustum* and wall-plaster, bridges and urban defences have also been found. A Rhine harbour can be assumed from its early mention in medieval sources of AD 858⁸⁷ (see Fig. 3).

Unfortunately, we possess only dedications to gods as indicators of temples. There appears to have been at least one temple for *Mars Leucetius*, one for Jupiter or probably for the Capitoline triad (the typical Roman state trinity), and at least an altar for the imperial cult. Since the actual buildings have not so far been found, we cannot know whether the temples were built in a Roman style (as can be assumed for the Jupiter-temple) or as native Gallo-Roman *Umgangstempel* (as would have been likely for *Mars Leucetius*).

The Roman architectural appearance of the city was completed by paved streets which

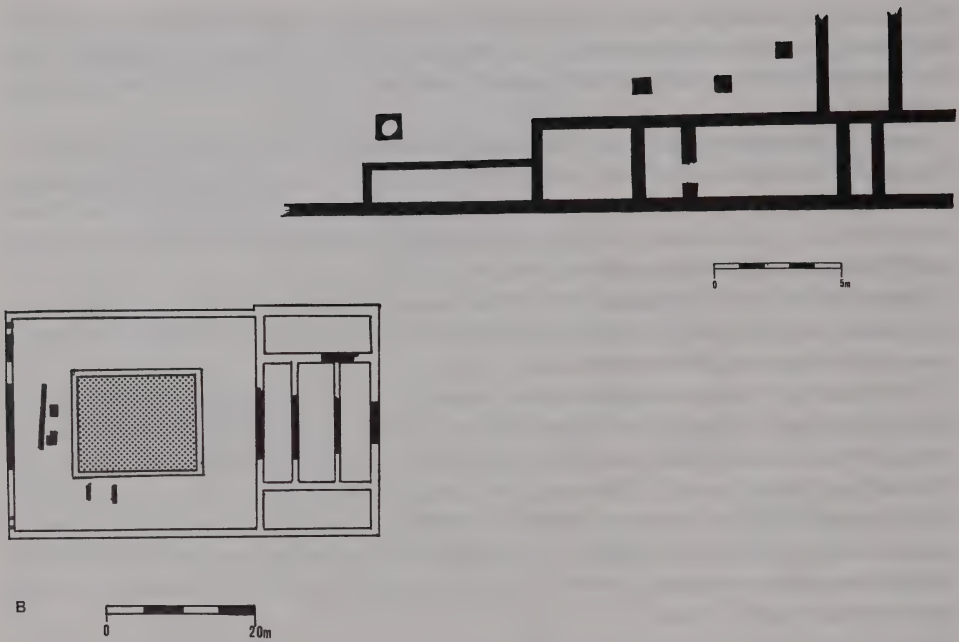


Fig. 3 Plan of a peristyle-house and of the *basilica* in *Borbetomagus*, re-drawn after Weckerling (1887) and Grünewald (1986).



Fig. 4 *Borbetomagus*, the capital of the *civitas Vangionum*. Streets according to Weckerling, cf. Grünewald (1986), based on a map by G. Illert (1950).

have been traced to a large extent (cf. Fig. 4). Mention has already been made of the very irregular arrangement of the town, which could be taken as proof that the city was not founded by Rome (as was Trier for example). Instead there seems to have been an older foundation dictating the course of the streets, probably that of the Celtic settlement, giving the city a more indigenous element in appearance, while a more regular extension may be seen in the southern part where more elaborate residences have been discovered.

This growing city, a relatively large *municipium*⁸⁸ covering approximately seventy-five hectares inside the *pomerium* as indicated by the cemeteries in the north, west, and south as well as the rivers to the east, increasingly relied on an efficient exploitation of the hinterland.

The Countryside

The countryside was fundamental to the settlement pattern, to the organisation of society and its political structuring because the essence of *civitas* is, in the words of M. Millett, the encompassing of town and country 'within the same administrative unit derived from LPRIA tribal group'.⁸⁹ A new element in the countryside was the *villa rustica*, defined by Rivet as the 'rural seat of one who needed land to hold power in the civitas'.⁹⁰

Around *Borbetomagus* there were a very large number of these *villae rusticae*, three in Osthofen on the road towards *Mogontiacum*, five in Abenheim on the road towards Bingen, one each in Weinsheim, Heppenheim, and at Horchheim on the road to Metz. A similar distribution can be found around the *vici* Alzey, Bingen, and Mainz. But despite this, villas were ubiquitous in the region, except for the less accessible western areas, around Donnersberg and the Rheinhessische Schweiz (Fig. 5).

Regarding their function, we can see from the few excavated villas that they were indeed noble seats, with baths and *hypocausta*, splendidly decorated with wall-plasters and mosaics (Pl. 2).

The fact that so few *villae* in the area have been excavated prevents us from establishing the necessary chronology for the development of the countryside.

Aerial photography has revealed a rough plan of a typical *villa rustica* just outside *Borbetomagus* (Fig. 6), similar to examples from Grünstadt and Bad Dürkheim-Ungstein. Known examples of *villae rusticae* are in the main typical of the Gallo-Roman type of villas with U-shaped halls and porticos; this concept of a 'hall'-type villa has been thought to have originated in Celto-Germanic society,⁹¹ which suggests that the occupants, the Celtic élite, remained attached to older forms, while desiring 'palaces', with all the amenities of Roman civilization, such as baths, wall-paintings, mosaics, or—very useful in this climate—*hypocausta*. Most of the earlier examples seem to date to the second century, a period of economic prosperity and peace as, with the *limes* securing the country, the army could now live from the newly incorporated territories on the right Rhine-bank, allowing a certain degree of surplus production, and thus prosperity on the left bank.⁹³ Some of the excavated examples show evidence of earlier, and sometimes even of late La Tène buildings, or more frequently of La Tène finds and graves, which indicate continuity in settlement (cf. Appendix I, columns B–D).

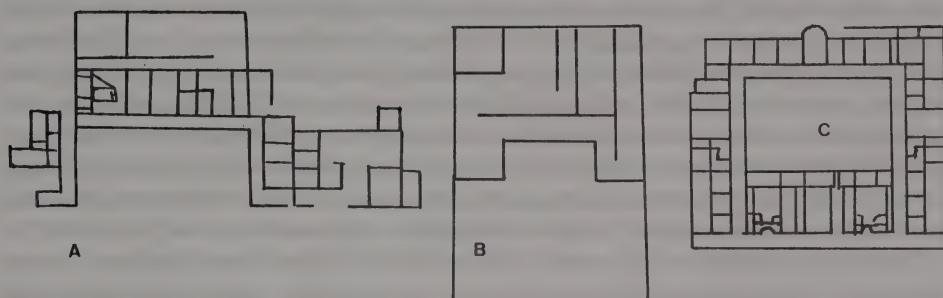


Fig. 6 An outline of *villae rusticae* in (A) Bad Dürkheim-Ungstein, (B) Worms-Weinsheim, and (C) Bad Kreuznach. Bad Dürkheim and Bad Kreuznach re-drawn after Cüppers (1990), Worms-Weinsheim after an aerial photo in Grünewald (1986: 50, fig. 32).



Pl. 2 The villa of Wachenheim during excavation, around 1900 (courtesy of Stadtarchiv Worms).

Not only the *villae rusticae*, but many places, villages, farmsteads and other sites seem to show continuity. La Tène graves and cemeteries, indicators of settlement, are found near Roman graves or settlements. Sometimes they overlap. A few striking examples are Abenheim, Heppenheim, Wörrstadt, Kleinwinternheim or Selzen, Nieder-Olm. In Wiesoppenheim, for example, we know of a large La Tène settlement where graves of the Roman period suggest continuity in settlement. Grave goods from the cemeteries of Badenheim and Sponsheim contain both native and Roman ware. Furthermore, Stümpel⁹³ shows that in Nieder-Olm two villas followed two settlements indicated by the presence of La Tène D cemeteries; similarly in Ober-Olm. In Leiselheim La Tène D *Trichtergruben* were found next to a Roman villa.⁹⁴

The pattern of settlement also appears to be similar. In La Tène D small hamlets or single farmsteads (Caesar's *aedificia*) seem to be the rule, as can be clearly seen from the territory of Ober- and Niederolm with five separate cemeteries. As Stümpel has pointed out, the Roman settlement pattern of individual *villae rusticae* does not mean a change from the La Tène pattern.⁹⁵ Moreover, one can observe the regular appearance of several villas together, three in Osthofen, four in Abenheim, six each in Engelstadt and Großwinternheim, indicating a more La Tène-style 'hamlet' arrangement than a large Roman-style *latifundium*.

Discontinuity, on the other hand, can be noticed in only a few examples, e.g. in Wonsheim where hardly any Roman finds followed an intensive La Tène D settlement, while a few sites in the fertile Rheinhessen were newly settled in the Roman period. A few new *villae rusticae* developed, especially around towns, and new *vici*, primarily Eisenberg where a *vicus* grew around a newly opened mining estate (see below), while the other *vici*, like Oggersheim, Alzey, Bingen, perhaps Nierstein, seem to have been of importance already in pre-Roman times.

In summarising, one may suggest a slight but systematic shift from less accessible areas to those territories in the plains and along Roman roads. This does not mean that all people moved, but that in those areas there was no élite desiring the display of their wealth in the form of *villae rusticae*. But in general we can state that there appears to be strong continuity in the pattern of settlement (hamlets and single farmsteads) and in the sites occupied. More striking is the quantity of villas already discovered in this territory. Since a *villa rustica* is a form of élite wealth-display,⁹⁶ one might suggest that there must have been relatively more people of wealth in the region than are indicated for the pre-Roman period by warrior-graves. From this, it could be speculated that the Roman Empire gave the population the impetus for upward social mobility; this impression recurs in relation to grave goods and epigraphy.

THE POPULATION PATTERN

In relation to funeral practices, we gain a strong impression of Romanisation. Instead of *Leichenbrand* and grave-gardens,⁹⁷ the local population of the Roman period used urns,⁹⁸ erected monuments and tombstones, set up testamentary obligations, but retained the habit of burning the property of the dead.⁹⁹ Many inhumed objects were first damaged, for example an axe found with a bent handle or a knife with a broken blade.¹⁰⁰ This is a habit not noted previously in Roman graves,¹⁰¹ while it was a very common phenomenon in Celtic warrior burials.¹⁰² It is not improbable to assume the survival of a Celtic ritual here.¹⁰³

Religion

Celtic deities survived, as did Celtic culture in general, though strongly influenced by Roman ideas. The evidence—inscriptions, statues, reliefs—is of Roman origin, but the Celts adopted these styles along with the foreign deities, to express their own religious beliefs.

We must therefore distinguish between two different types of deities. On the one hand, and more likely to be found in an administrative centre like the *caput civitatis*, were those deities representing Roman state religion (e.g. the imperial cult or members of the Capitoline triad) who were introduced by representatives of the Roman state, as well as other Graeco-Roman cults and foreign gods introduced by soldiers from all over the Empire. On the other hand, there were the numerous native deities for which the Roman style of statues or dedications on inscriptions, sometimes even a Latin name and representation, was adopted, both by natives (probably from the Romanized upper-classes who wanted to express their beliefs in a Roman style) and by people of foreign origin, like veterans who felt a need for the help of a local god. If there had been any unbroken continuity of Celtic traditions in a non-Romanized style—e.g. in a grove or with wooden statues—it would prove difficult to trace archaeologically if not associated with artefacts dating to the Roman period.

We know that the imperial cult was observed from an inscription of Gaius Candidius Martinus who was *sevir Augustalis* in the *civitas capital*.¹⁰⁴

Few dedications to deities of personified abstracta can be found. There is a dedication to *Victoria* by the councillor Lucius or Titus Romanus Respectus,¹⁰⁵ a second to *Mars* and *Victoria* by someone bearing a Celtic name from Eisenberg,¹⁰⁶ a third to *Fortuna* by Lucius Gnatius Mascellius;¹⁰⁷ i.e. two dedicants were Roman citizens, two bear Celtic names. The female companion of *Mars* is usually the Celtic goddess *Nemetona* with whom he even shared the same temple, for example, in Klein-Winternheim and in Trier. Thus, the combination of *Mars* and *Victoria* on a dedication by a person with a Celtic name might indicate that *Victoria* represents *Nemetona*.¹⁰⁸

Almost two thousand years of continuity are represented by the medieval St Nicolaus' church in Worms, where a Roman altar for St Nicolaus' pagan counterpart, Neptune, was found. This not only indicates a continuous strong belief in this type of 'god/saint', but it also makes us aware that Neptune in this case was not necessarily the 'God of the Sea' since the nearest sea was about four hundred kilometres distant. Neptune rather represents the god of the fishermen or may even be a river-god.¹⁰⁹ We are not aware of a possible Celtic parallel, although one may think of a 'personified' river Rhine.

It was Jupiter however, the Roman state god, who was most dominant in the *caput civitatis*. There are nine known inscriptions of him, usually as '*Iupiter Optimus Maximus*' (*I.O.M.*), and *Iuno Regina*,¹¹⁰ in *Borbetomagus*, which suggest the existence of a temple, if not a *capitolium* for the whole Capitoline triad, near the assumed *forum-basilica* complex underneath the medieval cathedral.

Early dedicants to Jupiter were on one hand Roman citizens and officials, like the *praefectus* of the *Ala Scubulorum* Gaius Barburius Festus from *Arretium*¹¹¹ or the prefect Lucius

Octavius.¹¹² The majority (approximately seventy-five per cent) of dedications to *I.O.M.* in *Borbetomagus* were made by natives—representatives with typical Celtic names (see Appendix II), like Maianus¹¹³ and Mallius. Therefore it may follow that they took *Iupiter Optimus Maximus* as equivalent to the Celtic *Taranis*,¹¹⁴ an equation about which we can be quite certain. An inscription from Chester mentions the *I(uppiter) O(ptimus) M(aximus) Tanarus*¹¹⁵ and a commentary on Lucanus also equates Jupiter with *Taranus*.¹¹⁶

The location on the cathedral mount, as the highest elevation, could suggest a pre-Roman sanctuary (*Viereckschanze*) of this major Celtic god existed, now replaced by a stone building. Continuity can also be seen in the now abandoned Donnersberg *oppidum*, always identified with the weather-gods *Taranis*, *Donar*, Jupiter.¹¹⁷ And as 'god of lightning' *Taranis*, *I.O.M.*, and occasionally even *Iuno*, are represented on reliefs with wheel and thunderbolt.¹¹⁸

It has already been pointed out by von Kienle that the cult of Jupiter and Juno Regina was a local characteristic of the Upper Rhine valley, found in larger towns, but atypical for any other Gallic *civitas*, and definitely not of Roman origin where the pair *I.O.M.* and Juno never had this importance.¹¹⁹ While his conclusion was to recognize Suebian deities, because *Triboci*, *Nemetes*, and *Vangiones* were believed in the 1930s to be of Suebian origin, it seems to me of more importance to stress both the Celtic idea of putting a female companion at a god's side (like *Mercurius* and *Rosmerta*, *Apollo* and *Sirona* (see below), or *Mars* and *Nemetona*) and the mainly Celtic origin of the dedicants. It seems that the Capitoline triad was of importance and represented a fusion of Celtic and Roman ideas, stimulated by a suggested early replacement of an important Gallic sanctuary for *Taranis* by a Roman-style temple for *I.O.M.* on the cathedral mount.

No other religious monument seems to have been erected so often in *Germania Superior* during the second and third century AD than the so-called *Jupitergigantensäulen*; the representation of *I.O.M.* as 'Gigantenreiter' can give more information about the character of the Romano-Celtic *Iupiter-Taranis*. The monuments consist of a *Viergötterstein* (of which around three hundred examples are known¹²⁰), i.e. a four-sided relief usually showing *Iuno*, *Minerva*, *Hercules*, and *Mercurius*, a column with scale pattern, and Jupiter riding on a horse above the giant (Pl. 3). Various examples, of either complete monuments or typical parts of it (like, for example, the *Viergötterstein*), have been found. Several examples were found at the site of the *forum* (cathedral) of the *civitas* capital *Borbetomagus* (Worms) and there is a recycled piece from the south cemetery of the Roman city. Other *Jupitergigantensäulen* were found in the suburbs Hochheim and Weinsheim, as well as in Alzey, Armsheim, Biebelnheim, Bingen, Eimsheim, Eisenberg, Frettenheim, Ingelheim, Kerzenheim, Planig, Udenheim, and Westhofen (see Fig. 7).¹²¹

The idea of the *Jupitergigantensäule* may have originated in the worship of Celtic gods in the form of trees, but the design is completely Roman in tradition (inspired by the Jupiter column of Mainz).¹²² The riding god defeating the giant is a concept which must derive from Celtic mythology. If we accept *Bauchhenß*' interpretation, the riding god (rather than the god driving a chariot) seems to represent the god of heaven; his fight against the giant illustrates the fight between good and evil. His attributes, 'wheel' and 'thunder' identify him as the god of light, a quality which Jupiter has only partially retained.

The Celtic character of *Iupiter Optimus Maximus* is obvious,¹²³ although his artistic representation is Roman in style. As to dedications to 'actual' Roman deities, we are left with the imperial cult and two private inscriptions to *Fortuna* and *Victoria*, while *Victoria* in combination with *Mars* may be identified as the Celtic *Nemetona*.

Some deities show in their names an obvious Celtic origin, and were either called by their Celtic names or by a combination of Celtic and Roman names.

In *Borbetomagus*, a temple, perhaps a Gallo-Roman *Umgangstempel*, can be assumed for the Celtic *Leucetius*, unified with the Roman *Mars*.¹²⁴ The importance of *Mars-Leucetius* in the whole *civitas Vangionum* seems obvious considering the number of inscriptions and reliefs found,¹²⁵ including a sanctuary in Ober-Olm which was in use from pre-Roman times up to late antiquity.

Of even more importance seems to have been the Celtic or Celticised Mercury, with *deo* often placed in front of his name, emphasising his non-Roman character.¹²⁶ According to Caesar the Gauls 'deorum maxime Mercurium colunt',¹²⁷ but, in contrast to *Mars-Leucetius* only occasionally as in Neustadt and Speyer do we find one of the 14 possible Gallic epithets added to his name.¹²⁸ Inscriptions to him can be found all over the *civitas Vangionum* and the neighbouring *civitates* (Fig. 7). The Celtic goddess *Rosmerta*,¹²⁹ sometimes *Maia*,¹³⁰ was often set beside him. Dedicants were of a native background, with Celtic names like *Vitalius Pelto*.¹³¹ The sanctuary of Mercury in Bechterbach-Gangloff was probably already situated outside the *civitas*.

Another Celtic goddess was *Epona*, already accepted as a deity by the Romans in Republican times; on a statue, which has been proved to be made in *Borbetomagus*,¹³² she is surrounded by horses. Relatively rare were *Sucellus*,¹³³ whose Roman equivalent *Vulcanus* is depicted together with Mercury and Minerva (the Celtic *Nemetona*) on a stone from Worms, and *Silvanus*.¹³⁴ The latter received a dedication from someone with the Celtic name *Lucios Cinnonis*.



Pl. 3 *Jupitergigantensäule*, reconstructed from various pieces of column found in Worms (courtesy of Stadtarchiv Worms).

A dedication to the three Celtic goddesses (the matrons who find their continuity up to the present in Embede, Warbede, and Umbede) in the form of the *Parcae* comes from Worms-Wiesoppenheim.¹³⁵

Sirona was the female equivalent to *Granus* who himself became assimilated to the Roman Apollo. A sanctuary like that of Hochscheid has not been found in this *civitas*, but there was an important sulphur spring at *Buconica* (Nierstein) 11 *leugae* north of Worms. It was

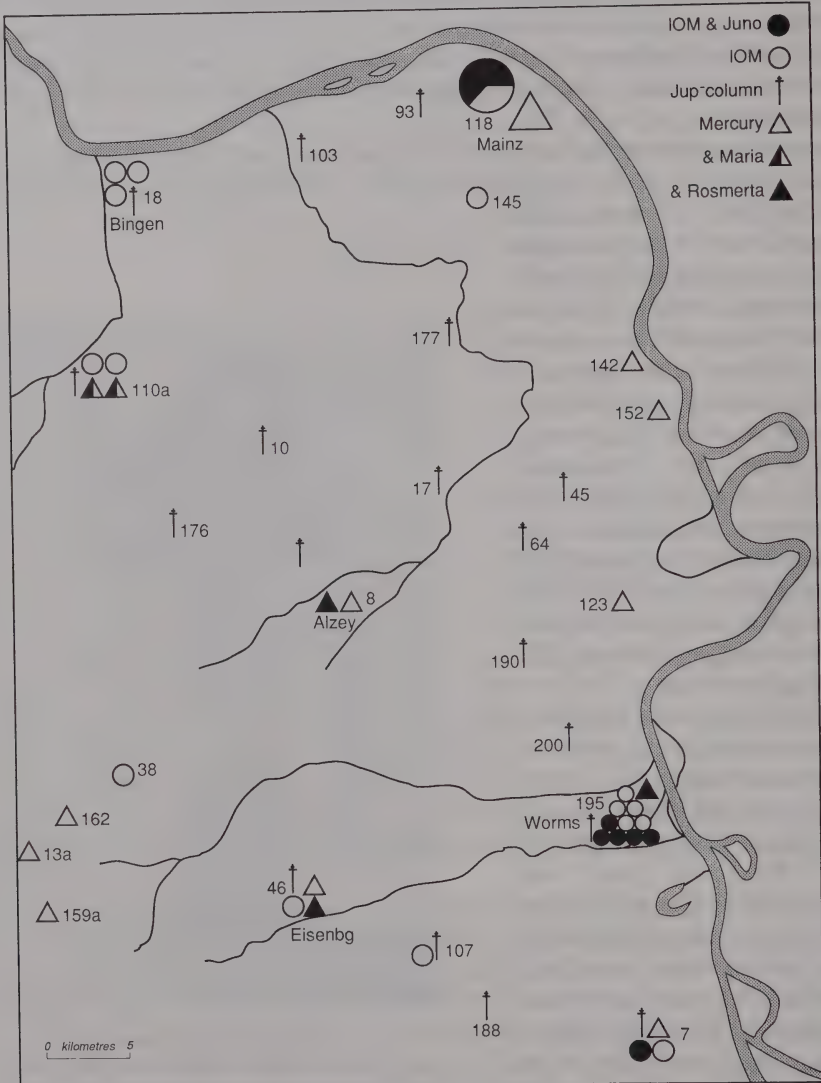


Fig. 7 The distribution of dedications to various deities (after Appendix I and *CIL*).

dedicated to Apollo *Granus* and *Sirona*.¹³⁶ Coins and other votive-objects date its usage from the first to the third centuries.

A dedication to the *Nymphae* by the *vicani* of Alzey, bearing Celtic names, is one of the few dated inscriptions.¹³⁷

The distribution pattern of inscribed dedications (Figs. 7 and 8) clearly indicates their use in the larger centres of the region, like *Borbetomagus*, *Mogontiacum*, *Altiaensium*, *Buconica*,

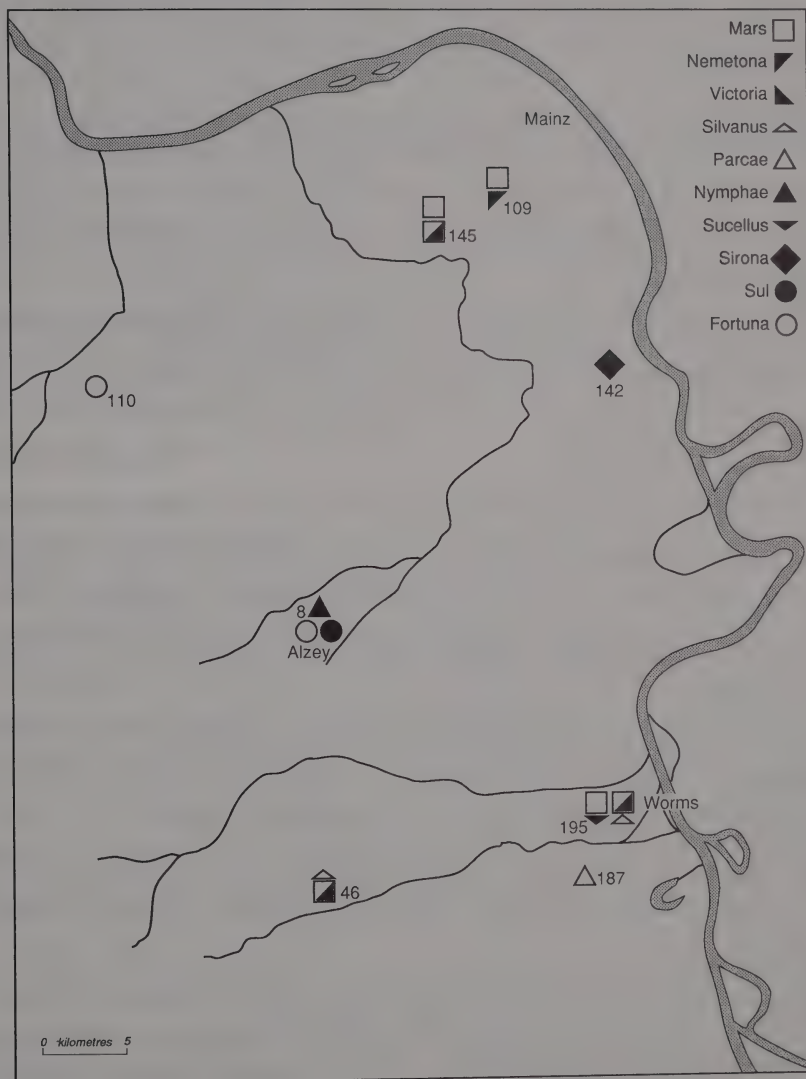


Fig. 8 The distribution of dedications to various deities (after Appendix I and *CIL*).

or Eisenberg, while reliefs carved in stone are more widespread, showing a different degree of Romanisation in towns as compared to the countryside.

Celtic Onomastics

The Celts used writing, borrowed from the Romans and Greeks, only sporadically. It was as part of the 'acculturation' process that some adopted the habit of erecting tombstones in a Roman manner with '*Dis Manibus*' on the top and the name of the commemorator at the bottom, or inscribed dedications with typical Roman formula like '*V.S.L.L.M.*', or took Latin(ised) names.

Altogether around two hundred and sixty inscriptions have been found inside the *civitas Vangionum* (excluding Mainz) recording approximately two hundred names, many of them belonging to the native population.¹³⁸ An analysis of this material shows its similarity to epigraphy in other Gaulish regions, e.g. *Gallia Lugdunensis*,¹³⁹ regarding the (Celtic and Roman) names used and the way in which Celtic names became Latinised, as the following short survey illustrates.

Beginning with the *gentilicium*, we can notice the same phenomenon as in the other Gaulish provinces. It was not usual for new Roman citizens to take the name of the emperor, so that we can find only five Aurelii¹⁴⁰ who are all soldiers, three of them from Thrace, two Valerii,¹⁴¹ and one Flavius¹⁴² out of two hundred people, i.e. the *gentilicium* of the emperor was probably taken only by those who were actual members of that *gens*¹⁴³ or had moved, for example from the eastern provinces.

Otherwise, the *gentilicium* was formed from the father's name, creating so-called '*pseudo-gentilicia*' based on local Celtic names, like Mallius.¹⁴⁴ Another possibility was the adoption of Latin *cognomina*, a habit which seems to be widespread in the *civitas Vangionum*; for example Acceptus became Acceptus,¹⁴⁵ similarly Candidus,¹⁴⁶ Romanus,¹⁴⁷ and Victorinus.¹⁴⁸ Some *pseudo-gentilicia* like Candidus or Acceptus are, according to Szabó,¹⁴⁹ so typical that they would even show the Gallic origin of the bearer if found outside the Gallo-Germanic provinces.

A few examples show an artificial creation, as in *CIL* 6244, when Victorinus' brother took the name Victorius Florentinus; i.e. the *gentilicium* seems to derive from the brother's name.

When looking at single names or *cognomina*, we find a large number of typical Celtic names, e.g. Mallius, Maianus, Seccus, Carantus, Smertullianus, Bellicus.¹⁵⁰

Other names showed an 'interaction between Roman and Celtic elements',¹⁵¹ like Saturnina, Saturninus resembling Celtic names beginning with *satto-*, Marcellina those with *marc-/merc-*, Decimus, Secundus, Secundinus, those beginning with *dec-* (s,d=δ), and Senecianus those with *senn-*.¹⁵²

Many of the names of Latin origin, like Servandus and Senecio or Senecianus,¹⁵³ were characteristic of Gaul. Names which are hardly attested outside the Gaulish provinces came into use, so that, for example, Sollemnus is limited to Gaul, while names like Secundus or Severus came with soldiers into the provinces.¹⁵⁴ These 'provincial' names like Saturninus or Victorinus were relatively rare in Italy.¹⁵⁵

A large number of names appear to have been artificial creations with alliteration, if not deriving from a filiation as *gentilicium*, e.g. Faustinius Faustinus, Lupulius Lupianus, Spectatia Spectata, Severia Severa, Victorius Victor.¹⁵⁶

Regarding the degree of Romanisation, the Roman *tria nomina* rarely appears, but when it does, filiation and *tribus* are frequently missing. *Praenomina* are hardly used, instead we find *gentilicium* and *cognomen* alone, or with a filiation at the end of the nomenclature; Celtic-style single names were still common.

What is important is not the survival of Celtic onomastic in a world dominated by Rome, but that Romanised names and Roman ways of name-giving were incorporated into the Celtic tradition, creating an enriched source of names. In this Szabó should be followed,¹⁵⁷ in that we should not interpret the survival of Celtic onomastics as an opposition to Roman culture,¹⁵⁸ but allow that

it was possible for a society to come about with a culture in which Celtic and Roman elements were not in opposition... they adjusted the custom of using family names, which was something new to them and which they had taken over from the Romans, to their own tribal traditions, by bearing the family name formed from the father's name. As for the *cognomen*, they either retained their Celtic name or chose a Latin name that was akin to it. This last they did so often that the Celtic and Latin elements became inseparably fused in the name.

The Use of Epigraphy

A considerable increase in the use of epigraphy from the first to the second century can be traced (Fig. 9).¹⁵⁹

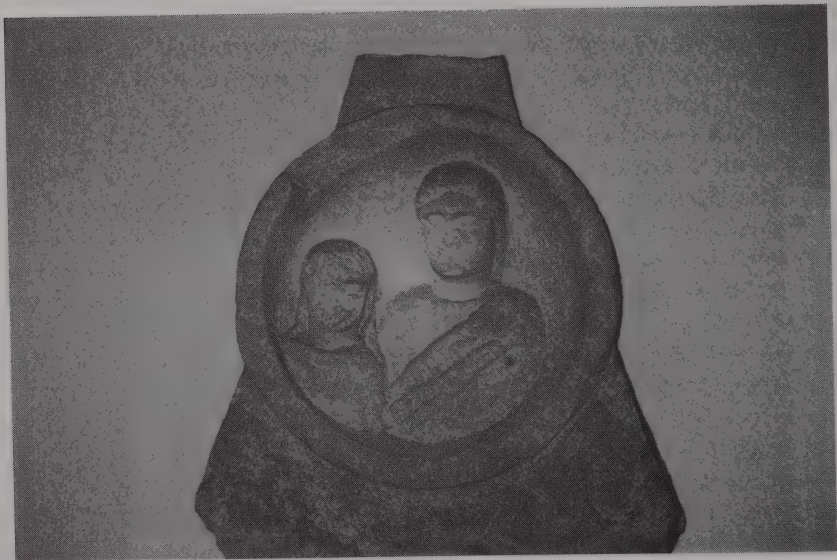
In the first century, it is primarily soldiers and generals who make use of inscriptions (Pl. 4). One exception is the tombstone of a civilian who was, or had become, a Roman citizen, Quintus Celius Firmus.¹⁶⁰

Only in the second century, did the native population widely accept epigraphy for tombstones or dedications, and instead of soldiers' memorials,¹⁶¹ we find inscriptions for members of the local élite like decurions, teachers, doctors, traders, and many of unknown profession. This increase runs parallel with developments in other western provinces.¹⁶² A few people wanted to show, by their use of the *tria nomina*, the possession of the precious Roman citizenship.¹⁶³ For the same reason, it was usual to state the name of the commemorator, together with expressions like 'faciendum curavit'¹⁶⁴ or 'frater et heres',¹⁶⁵ because the typical Roman institution of a 'will' including a testamentary obligation needed at least the *ius Latii* and therefore this must have been seen as an expression of status.¹⁶⁶

Romanitas was also demonstrated where children had Roman names while their parents retained their Celtic names, or when we find a mixture of Roman and indigenous costumes and hair-styles on reliefs (Pl. 5).

Typical of the second and early third centuries are tombstones like that of a trader from Worms-Weinsheim, similar to the *Igelsäule* of Trier, emphasising social function; such displays of wealth took place in Italy already in the first centuries BC /AD.¹⁶⁷

Pl. 4 The tombstone of the Celtic soldier Argiotalus, son of Smertulitanus (courtesy of Stadtarchiv Worms).



Pl. 5 Tombstone (Archaeology Museum, Worms).

The third century still saw quite a widespread use of epigraphy, and we now find inscriptions more frequently in the countryside.¹⁶⁸ The fact that many names appear to have been 'gekünstelt' and 'primitiv' could, if we accepted Scharf's view,¹⁶⁹ indicate the use of epigraphy by people who were less Romanised than the representatives of the élite of the second century. In Nierhaus' interpretation there was an impoverishment of the old wealthier citizens, while the poorer, less Romanised social strata rose quickly.¹⁷⁰ This might also be assumed from the distribution pattern of villas and the widespread wealth of grave goods which may suggest a relatively larger stratum in society of wealthy people than existed in pre-Roman times; but we then have to consider that firstly, most sites of so-called villas have not yet been excavated, are therefore not dated and thus cannot provide a chronological development, and secondly, that the late pre-Roman Iron Age of the region under consideration was indeed a period of poor grave goods.

If epigraphy was used mainly by upper-class people to show their *Romanitas*, as suggested above, and the use of epigraphy had been as widespread as the adoption of the *villa rustica*-building type, then the distribution of inscriptions may indicate the location of their residences. Instead, as can be clearly seen in Figure 10, inscriptions seem to be concentrated in larger settlements and along major roads, while there are many elaborate villas without inscriptions. This is due to the epigraphic habit, as already mentioned, with epigraphy mainly reflecting the inner-élite competition of larger settlements, such as *Borbetomagus* and *Mogontiacum*, and also Alzey, Bingen, Eisenberg, and Altrip. The fact that in the third century more inscriptions come from the countryside, even some from relatively remote areas, could indeed suggest social change such as a disintegration of the *civitas*.

From the epigraphy, it seems possible to distinguish various social layers within the *Vangiones* in relation to the degree of Romanisation. We find a Romanised élite who have gained the *civitas Romana* mostly by holding office, and which decorates itself with Roman-style names, quality inscriptions and reliefs. Another less Romanised stratum attempts to

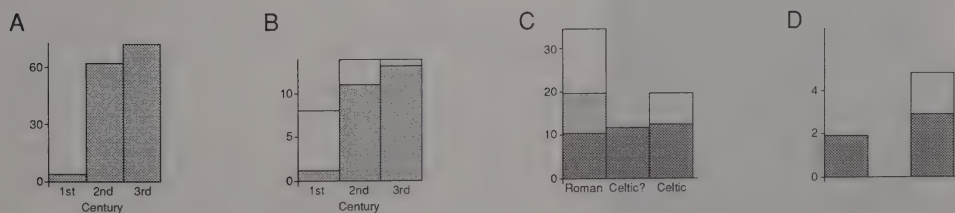
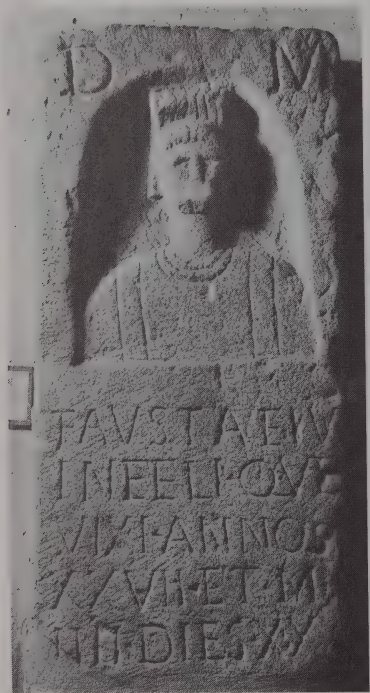
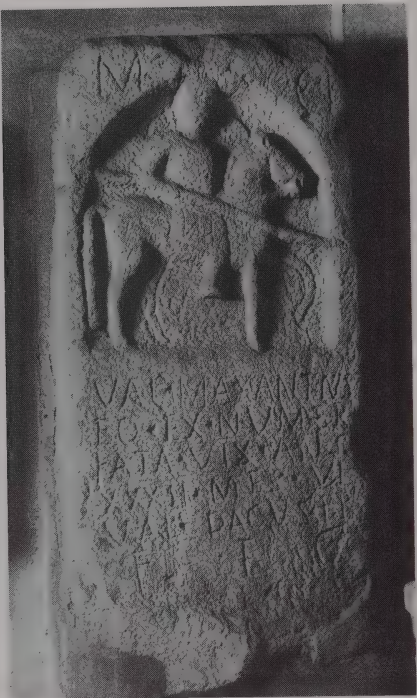


Fig. 9 The use of epigraphy in the *civitas Vangionum* and the origin of names in Worms and Alzey. (A) number of names of natives and (B) number of inscriptions (white = military personnel) in the first, second and third centuries, in the *civitas Vangionum* (Scharf, 1938: 94 ff.). For Worms (C) and Alzey (D), number of names of Roman origin (dark = natives, shaded = relatives bearing Celtic names, white = soldiers) possible Celtic origin and Celtic origin (dark = the full name of Celtic origin, white = at least one Celtic element).

Pl. 6 The tombstone of the Valerius Maxantius (courtesy of Stadtarchiv Worms).



Pl. 7 The tombstone of Fausta, museum Worms (courtesy of Stadtarchiv Worms).

copy Latin names. Then there are some with a Celtic cognomen, and others have just one Celtic name. Good quality stone and reliefs tended to be used by people bearing proper Latin names (Pl. 6), often with *tria nomina*, while some poor quality works (like that of Fausta (Pl. 7)) often belonged to those whose names suggest a less Romanised background.

Regional variations are also recognizable. From the epigraphy, the *vici* Alzey and Eisenberg appear to have been relatively Celtic, and similarly in the hilly area west of the *civitas* (e.g. in Landstuhl, Wolfstein, or St Julian), while in the *civitas* capital most people adopted Latin(ised) names in one way or another (Fig. 10).

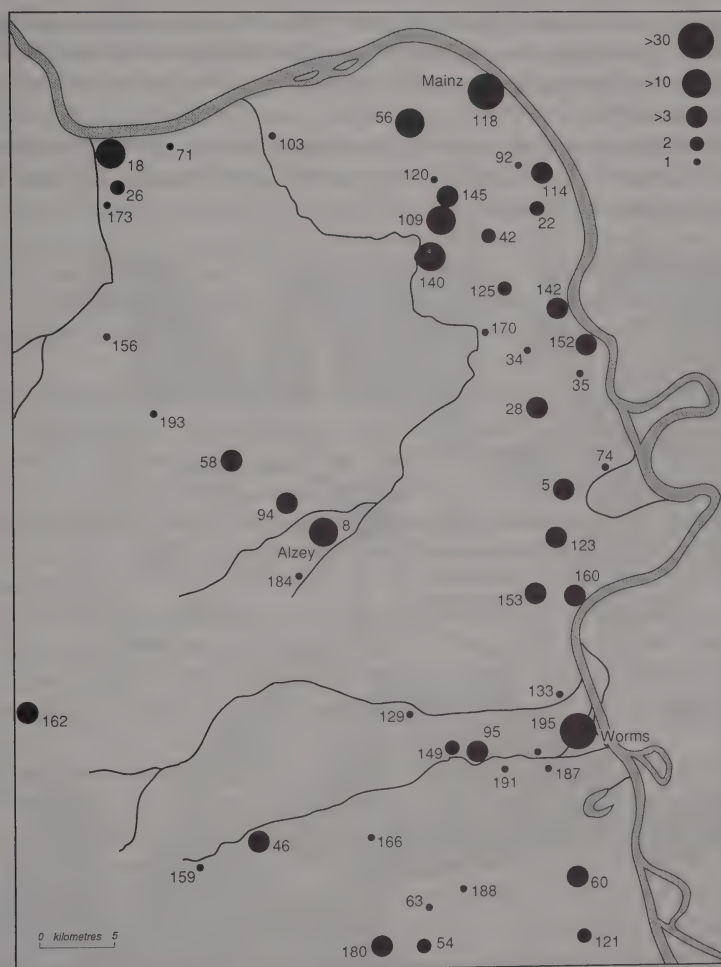


Fig. 10 The distribution of inscriptions in the *civitas Vangionum*, including Mainz, (after *CIL, Fundmünznen* and Appendix I, column H).

Mobility

The Roman Empire of the Principate brought the possibility of a mobility not conceived of in a La Tène society with its system of personal bondings. The army seems to be the major motivating force of social change. The epitaphs of most foreigners are those of soldiers, from units first recruited in *Hispania*, *Gallia*, *Belgica*, or on the Danube, who often died during their duty, or as veterans after their period of service. Many of them came from other Celtic regions, like Tartus '*natione Treveri*' or the '*Helvetius*' Licinus from Nantes, but there were also Thracians, like Aurelius Dizza and his companions.¹⁷¹ There were officials from Arezzo, civilians from Monetium, Texander, and Termes.

The evidence from the funerary record supports this view of increasing mobility (Fig. 11). Burials indicate, for example, the occasional deceased of British or Marcomannian origin,¹⁷² while the majority of grave goods, especially *fibulae*, show the region's strong relation to central Gaulish areas.¹⁷³

On the other hand we can find *Vangiones* outside their *civitas*, like the mounted cohort on Hadrian's Wall in Britain, and Candida—a common *Vangiones* name—who was stationed at fort Niedernberg upon the Rhine.¹⁷⁴

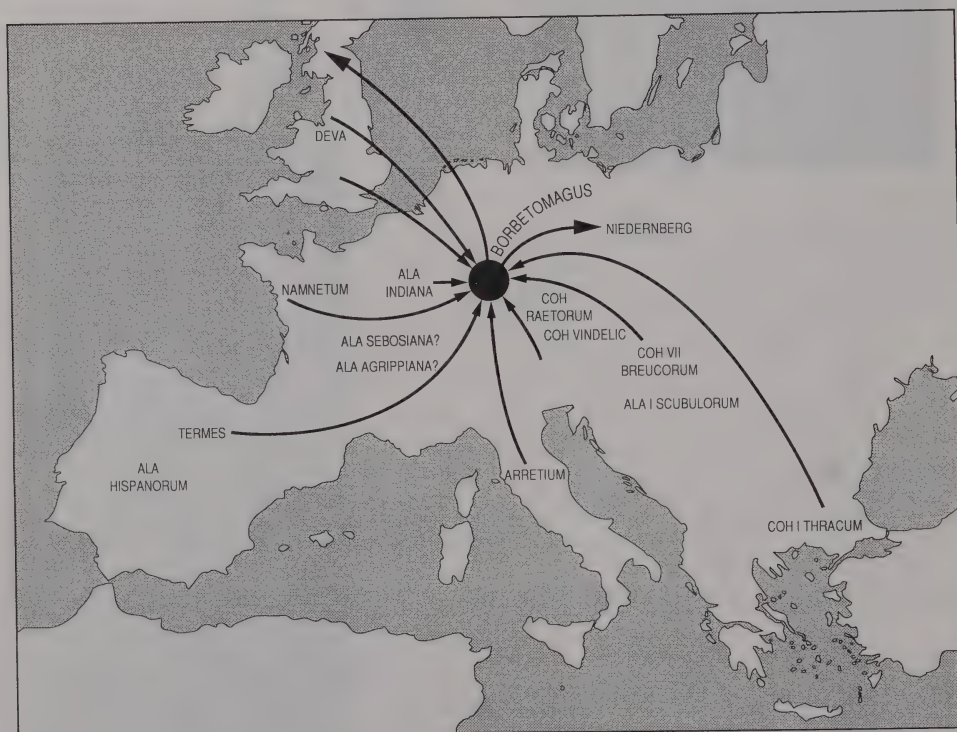


Fig. 11 The movement of people and military units into and out of *Borbetomagus* according to inscriptions and grave goods.

THE ECONOMIC CHANGES

Few details are known about the organization of the La Tène D economy. The Celtic economy had long advanced beyond the subsistence level of the early Iron Age and at the eve of Caesar's conquest efficient production of surplus was necessary to enable the exchange of prestigious goods. In *oppida* like Manching large quarters for craftsmen have been found¹⁷⁵ and 'non productive classes'¹⁷⁶ had developed. Coinage (see below) was introduced and efficient agricultural exploitation made possible.¹⁷⁷ The Gallic War of 58–50 BC, however, seemed to have disrupted the economy of Eastern Gaul for approximately a century.¹⁷⁸

Although the Celts had long-established trade contacts with the Mediterranean world, access to prestige goods was controlled by the aristocracy;¹⁷⁹ finds from the Mediterranean were extremely rare in the territory of late La Tène *Vangiones*. In Roman times, imports increase enormously, with Roman traders finding a new market there as early as the twenties BC.¹⁸⁰ But prestigious goods, like terra sigillata or wine, lost their value with the coming of the army a decade later, owing to the subsequent abundance of these goods, and eventually their local production. In order to appear to keep up a 'Roman way of life', oil, ointments, perfumes, fish paste, etc. were imported to the Rhine throughout the following centuries.

Locals, too, got involved in the wider and more market orientated Roman economy, so that, for example, a trader,¹⁸¹ a *negotiator* and a 'river-shipper' can be found in *Borbetomagus*.¹⁸² Despite flourishing trade and craft production, the region remained dependent on agriculture, and except for the examples mentioned, wealth was still mainly attributed to the possession of land.

Villae demonstrate the relationship between town and country. They were the residences of *decuriones*, elaborately decorated with wall-plaster, mosaics, and baths. The proximity of villas to Roman roads and towns shows the need for transport and perhaps an orientation towards a market economy.¹⁸³ The density of villas spatially does not allow for the existence of large *latifundia* farmed by slaves; large-scale production for export to Rome, as in North Africa, also seems to have been unlikely because of the tremendous costs of transporting goods across the Alps.

Changes in the types of crops grown cannot be proved, except for the introduction of vines which is suggested by numerous installations of wine-presses and associated tools. An increase in the production of cereals has to be assumed, in order to supply the cities and armies,¹⁸⁴ but very extensive agricultural exploitation had already been possible.¹⁸⁵

In the Roman period, the centre of iron-mining in the region became Eisenberg, a *vicus* on the road from Metz to Worms dating to the first century AD. The major occupation of its inhabitants was the iron production industry. The smelting furnaces were simple constructions. In the early period, iron bars were still made in the pre-Roman form of double-pyramids. In Göllheim, further west, a copper-mine with 12 shafts and evidence for Roman surface mining have been found, that was probably in use during the second and third centuries AD.¹⁸⁶ Despite the pre-Roman double-pyramid bars, only mines opened during the Roman period have been found. Army management for the mines has been suggested on the basis of a dedication of an active legionary to *Mars*,¹⁸⁷ but the fact that native techniques were

employed rather indicates native exploitation. In contrast, the quarry at Bad Dürkheim, *Krimhildenstuhl*, exploited only shortly after AD 200, was worked by the 22nd legion.

There was a complete break in the style of pottery. Not that new techniques were introduced—the potter's wheel had already long been in use. But virtually no single grave with mixed La Tène and Roman ceramics has been found. Stümpel explains that a quick change in production was possible because the La Tène pottery industry, which used standardized forms and patterns, was based in two centres around Worms and Kreuznach supplying Rheinhessen and Nordpfalz with fine ceramics, and also with painted ware, so that the change had only to occur in those two centres.¹⁸⁸ On the other hand, one could speculate that the new and 'fashionable' Roman pottery was now favoured for use in funerary contexts over the colourfully painted late La Tène ceramics.

Many pottery kilns suggest a continuous pottery production in *Borbetomagus*, but, like the *Gesichtskrüge* (face-jugs) of the later Empire, the Worms pottery shows only local distribution, while imports of pottery came mainly from nearby Rheinzabern.

While traditional Celtic crafts like carpentry or metalworking declined, other crafts were introduced, for example, stone carving and glass-blowing.

The Celts had their own coinage, but they were not accustomed to a monetarized economy. Instead, coins seem to have been used more as political symbols, enabling tribe and kings to demonstrate their importance.¹⁸⁹ There are coins attributed to the *Vangiones*,¹⁹⁰ but, as has been already pointed out by Bannert,¹⁹¹ relatively few of them were actually found inside the *civitas Vangionum* and they may well have been minted elsewhere. The coins found there originate from all over the Celtic world. Coins from the *Catalauni* and *Leuci* seem to be especially common, while those of the neighbouring *Treveri* and *Mediomatrici* are relatively rare (see Appendix I, column N), probably indicating that these two tribes never played any dominant role in the Vangionic region. Indeed, this distribution shows no clear dominance by any coinage, suggesting that there was probably no mint in the territory. It could also demonstrate trade contacts or the mobility of individuals, so that the concentration of coins in camps at *Mogontiacum* could have been due to Celtic auxiliary soldiers of various origins being assembled there. Finds of scales (*Schnellwagen*)¹⁹² suggest that the weight of precious metal—and also of coins, rather than their face value—was of importance.

The minting of Celtic coinage continued during the reign of Augustus even in military contexts,¹⁹³ as seen in Mainz legionary fortress.¹⁹⁴ But then, with the end of the Celtic coinage and mints, came the end of independence, too. The Roman coinage, which had circulated in large quantities since Augustus' reign (see Fig. 12), corresponding with the appearance of soldiers along the Rhine, caused the gradual spread of coin use, first in the early and large military site of Mainz, then, in the later towns affected by the army, e.g. Worms and Alzey.

Less so in the countryside. Finds of coins are widespread, but only in small numbers. Since, unfortunately, there is little documented in *Fundmünzen* (FMRD), the ratio between coin finds in towns and the countryside cannot be examined, but we can state that hoards have primarily been found in larger settlements (Appendix I, column M).



Fig. 12 The distribution of coin loss for Worms, Alzey, Mainz and Bingen, percentages compiled according to the information given in *Fundmünzen*. (A) distributions set against the average (after Appendix III).

The 12,000 to 24,000 legionaries stationed inside the *civitas*, each earning 10 *asses* per day¹⁹⁵ or 228 *denarii* per year¹⁹⁶ (making an allowance for clothing, food, subscriptions, etc. of approximately twenty per cent), caused between 2.5 to 5 million *denarii* to flow into the *civitas* every year, paid to locals on regular visits to local markets, and for food and drinks.¹⁹⁷

This, together with a taxation system based on coinage, forced the provincial inhabitants to use Roman coins. The development would only have been delayed if we assume that the local aristocracy initially collected goods in kind from their 'subjects' and clients, and paid Rome in cash, which they got, for example, from transactions with the Roman army.

A more monetarized economy¹⁹⁸ would have allowed land to be sold and veterans to buy land. Traditionally, all land was owned by the tribe and controlled by the nobles who could not sell it, but gave it to 'clients'. Monetarisation and taxation on all land eventually replaced the patron-client relationship with that between landlord and tenant;¹⁹⁹ a veteran and Roman citizen who bought a plot of land could hardly become a client of a Celtic nobleman.

SUMMARY

The Romans brought about elementary changes in society. The La Tène social structure and bonding system disintegrated, not through a conscious policy of Romanisation, but as a consequence of the Roman imperial policy to secure peace. The carrying of weapons, symbolic of Celtic aristocracy, was forbidden, druids were prosecuted, a new mobility destroyed traditional relationships, and since Rome organized the recruitment of the natives for the *auxilia*, the concept of 'warrior' was replaced (from the end of the first century) by that

of a soldier serving 25 years abroad and often never returning. In this way, the Celtic concept of the 'warrior' split into those of 'soldier' and 'councillor'.

This, together with the monetarization of the economy, the possibility of avoiding the local hierarchy by calling on the Roman governor, and the development of a 'Handwerks- und Dienstleistungsgruppe' (manufacturing and service-trades groups²⁰⁰) which removed members of the lower classes from their social bondings,²⁰¹ caused a re-structuring of Celtic society, bringing an increased independence in the choice of profession, and the possibility of social mobility to lower stratas, while reshaping the influence of the élite, with their dominance shifting from personal to more formal relationships.

With more prosperous times, there was even an increase in the numbers of the élite, which was now based on wealth, members serving in the *ordo*, wearing the Roman toga, bearing Latin names, and attempting to gain the precious Roman citizenship. In contrast to the few La Tène warrior graves, it took a much larger élite to build Gallo-Roman villas. Limited La Tène grave goods such as mirrors become increasingly common. The epigraphy may suggest that the Romanised second-century élite gave way to less Romanised layers in the third century. But it is not only the élite who became 'Roman', the lower classes did so too.

People accepted various elements of the Roman culture because this meant higher living standards (theatres, baths, water supplies, Roman stone houses with under floor heating, etc.). The aspiration towards the precious Roman citizenship—Rome's '*Lockmittel*' for the native élite²⁰²—is reflected in the archaeology: locals accepted Roman funeral practices (the use of urns and the Charon-coins), Roman cuisine (use of *mortaria*, imports of oils and fish sauce), Latin(ised) names and epigraphy (mainly as an expression of Roman citizenship). On reliefs, they tend to appear usually in Roman, or at least mixed Celtic and Roman costume.²⁰³ Since the provincial élite acquired a Graeco-Roman education, Latinisation came automatically, a factor which of course did not apply as strongly to people of lower social standing, especially those outside an urban environment.²⁰⁴

Various distribution patterns show strong regional variations, with usually a contrast between 'town' and 'countryside'. Epigraphy, for example, is very common only in towns, can also be found along major roads, but rarely appears anywhere else. Typical Roman cults, like *I.O.M.*, and concepts such as the inscribing of dedications are again found primarily in larger towns. Celtic onomastics were less influenced by Latin names in more remote areas in the west, while, especially in *Borbetomagus*, names tended to become Latinised. Villas seem to be extremely widespread, though usually close to a Roman road, except in the western half of the *civitas*.

Thus, it seems that Roman culture was strong in the cities of Worms and Mainz where a strong contact with the Romans created an atmosphere of 'acculturation' and assimilation; to a lesser degree, this is also the case for Alzey and Bingen. And from the towns, Roman culture spread out into the countryside.

Abstract

This is a study of the process of integration of the Vangiones into the Roman Empire from the first century BC to the third century AD. These were a Celtic people, as will be shown, on the left bank of the Rhine. Changes in settlement patterns from La Tène to Roman times are analysed in detail, like the decline of oppida on hilltops, the form and function of villae and the urbanisation as seen in the civitas capital Borbetomagus (Worms). The various changes in society are investigated through a detailed study of Celtic onomastics, the use of epigraphy, comparison of élite residences in pre-Roman and Roman times, etc. The influence of urban settlements and the army (which was based in the provincial capital Mogontiacum on the land of the Vangiones) on the Romanisation process are mentioned, as well as economic developments, especially the introduction of coinage. Three appendices give information of over more than two hundred sites in the civitas, listing names, deities, and titles found on the over two hundred and sixty inscriptions, and produce a statistic for coin use of some sample sites.

Acknowledgements

This is a shortened and revised version of the report submitted in partial fulfilment of the requirements for the degree of MA in Archaeology of the University of London in 1992.

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*Appendix I***List of sites**

The following list gives the information for the various distribution pattern maps. It has been compiled using the information given in Franke (1960), Chantraine (1965), Behrens (1923), Kühne (1942), Kofler (1888), updated with Stümpel (1955, 1956, 1959, 1967a, 1967b, 1969, 1978, 1986, 1991), Grünwald (1986, 1989a, 1989b, 1990), Bittel (1981), Engels (1967), Kriesel (1978: Karte 16–17).

Explanations**ad column f: 'graves of the La Tène élite'**

a	grave with Italian amphora	sr	string-ring, indicating a warrior grave
w	grave with military content	k	knife
W	more than one 'warrior grave'		

ad column k: 'settlement'

CC	<i>Caput Civitate</i>	V/VC	<i>Villa</i> or <i>Vicus</i>
VR	<i>Villa Rustica</i>	B	'Road Post'
VC	<i>Vicus</i>	?	not certain
x	traces of settlement		

ad column l: 'continuity'

continuity	=	-	less occupied
continuity and increase	=+	--	abandoned site
increase in settlement	+	.	not available
new settlement	++		

ad column n: 'Celtic coins'

A	Senonen	M	Bellovaker
B	Leuci	N	Hermunduren
C	Treveri	O	Carnuten
D	Aduatuker	P	Helvetii
E	Nemeti	Q	Kaleten
F	Catalauni	R	East Celts
G	Vangiones	S	Baiocassen
H	Mediomatrici	T	Veliocassen
I	Boier	U	Averner
K	Sequani	V	Haeduer
L	Ambiani	W	Iceni

hrd coin hoard of unknown denominations

(a number in front of a letter indicates the number of coins found)

Appendix I: Sites

No.	Place	La Tène	finds	graves	settlement	graves of the élite	finds	inscriptions	graves	villae	settlement	continuity	coin hoards	Celtic coins
a	b	c	d	e	f	g	h	i	j	k	l	m	n	
1.	Abenheim (Ws)	x	x	x	w	x	-	x	4	VR	=	-	?	
2.	Albig	x	x	-	w	x	-	x	-	.	=	-	-	
3.	Albisheim	.	-	-	-	x	-	-	x?	VR?	++	-	-	
4.	Albsheim	x	x	?	.	-	-	x	x	VR	=	-	-	
5.	Alsheim	x	x	-	-	-	3	x	>1	VR	++	-	-	
6.	Altleiningen	-	-	-	-	-	-	-	-	-	.	-	F	
7.	Altrip	-	-	-	-	x	25	x	-	V	.	-	-	
8.	Alzey	x	x	x	w	x	>10	x	-	VIC	=	2	2A2B CDE	
9.	Appenheim	x	x	-	-	x	-	x	-	x?	.	-	-	
10.	Armsheim	x	x	x	a	x	-	-	x?	x	=	-	-	
11.	Bad Dürkheim	x	x	x	-	x	x	-	-	.	=	3?	ABQ	
12.	Badenheim	x	x	-	-	x	-	x	-	.	=	-	-	
13.	Battenberg	-	-	-	-	x	-	-	-	.	.	1	-	
13a.	Bechenheim	x	-	-	-	x	-	-	-	-	.	-	-	
14.	Bechtheim	x	x	-	sr	x	-	-	1	VR	=	-	-	
15.	Bechtolsheim	-	-	-	-	x	-	x	1	VR	++	-	-	
16.	Bermershm, Ws	x	x	-	-	x	-	x	-	.	.	-	-	
16a	Bermershm, Az	-	x	-	-	-	-	x	-	.	.	-	-	
17.	Biebelnheim	x	-	-	-	x	-	-	1	VR	+	-	-	
17a.	Biebelsheim	-	-	-	-	x	-	-	-	-	.	-	-	
18.	Bingen	-	x	-	w?	x	>10	x	-	VC	+	2	M	
19.	Kloster, B.	-	-	-	-	-	-	-	x	VR	++	-	-	
20.	Bingerbrück	x	x	.	-	x	1	.	.	.	.	1	H
21.	Bischheim	-	1	-	-	x	-	-	-	.	.	-	-	
	Blödesheim	see under Hochborn												
21a.	Bockenheim	x	1	-	-	-	-	-	-	.	.	-	-	
22.	Bodenheim	x	x	-	-	x	2	x	2	VR+?	=+	-	-	
22a.	Bornheim	x	-	-	-	-	-	-	1?	VR?	.	-	-	
23.	Bosenheim	x	-	-	-	x	-	x	-	.	++	-	-	
24.	Bubenheim	-	x	-	-	x	-	x	1?	VR?	=	-	-	
25.	Budenheim	x	x?	-	-	x	-	x	1	VR	+	-	-	
26.	Büdesheim	-	-	-	-	x	2	?	1-3?	VR	++	-	-	
27.	Dachenheim	-	-	-	-	-	-	-	-	.	.	-	-	
28.	Dalheim	-	x	-	-	x	1	x	1	VR	=	-	-	
29.	Dalsheim	x	x	-	-	x	-	x	-	.	=	-	-	

Appendix I: Sites

No.	Place														
		finds	graves	settlement	graves of the élite	finds	inscriptions	graves	villae	settlement	continuity	coin hoards	Celtic coins		
a	b	c	d	e	f	g	h	i	j	k	l	m	n		
30.	Dannenfels	x	-	-	-	-	.	-	-	.	-	-	-	B2E	
31.	Dannstadt	-	-	-	-	-	x	-	-	.	.	-	-	-	
32.	Dautenheim	x	x	x	-	x	-	x	1	VR	=	-	-	-	
33.	Deidesheim	x	-	-	-	x	-	x	-	.	+	-	-	D	
34.	Dexheim	-	x	-	-	x	1	x	1-4?	VR	=+	-	-	-	
35.	Dienheim	x	x	-	k	x	1	x	1-2	VR	=	-	-	-	
36.	Dietersheim	x	-	-	-	x	1	-	-	.	.	-	-	-	
36a.	Dittelsheim	-	-	-	-	x	-	x	-	.	.	-	-	-	
37.	Dirmstein	-	-	-	-	-	-	x	-	.	+	-	-	-	
38.	Donnersberg	x	-	x	-	-	-	-	-	-	-	-	-	hoard	
39.	Dorndürkheim	-	-	-	-	x	-	-	-	.	.	-	-	-	
40.	Dromersheim	x	x	-	w	x	-	x	2?	VR	=	-	-	-	
41.	Duttweiler	-	-	-	-	-	-	x	-	.	+	-	-	-	
42.	Ebersheim	-	-	-	-	x	2	1	-	.	+	-	-	-	
43.	Eckelsheim	x	x	-	-	x	-	x	-	.	=	-	-	-	
44.	Eich	x	x	x	w	x	-	x	>1?	x	==	-	-	-	
	Eichloch	see under <i>Rommersheim</i>													
45.	Eimsheim	-	x	-	-	x	-	x	-	x?	.	-	-	-	
45a.	Einzelthum	x	-	x?	-	x	-	-	-	.	.	-	-	-	
46.	Eisenberg	.	-	-	-	x	>3	x	1	VR&VC	++	1	-	3B6F	
47.	Ellerstadt	-	-	-	-	x	-	x	-	?	++	-	-	-	
48.	Elsheim	x	x	?	k	x	-	x	1?	VR+?	=	-	-	-	
49.	Engelstadt	x	-	-	-	x	-	x	3-7	VR	++	-	-	-	
50.	Ensheim, Ws	x	-	-	-	x	-	x	-	?	+	-	-	-	
51.	Eppelsheim	x	-	x?	-	x	-	x	4	VR	++	-	-	I	
52.	Eppstein	-	-	-	-	x?	x?	-	-	.	+?	-	-	-	
53.	Erbes-Büdeshm	x	x	-	w	x	-	1	-	x?	=-	-	-	-	
54.	Erpolzheim	-	-	-	-	x	1	-	-	B	++	-	-	-	
55.	Esselborn	x	x	-	-	x	-	x	-	.	=-	-	-	-	
55a.	Essenheim	-	x	-	-	-	-	x	-	?	=	-	-	-	
56.	Finthen, Mz	x	x	?	-	x	>19	x	2	VC&VR	=	1	-	-	
57.	Flomborn	x	x	x?	-	x	-	-	-	.	-	-	-	-	
58.	Flonheim	x	x	-	k	-	4	x	-	.	=	1	-	-	
59.	Framersheim	x	x	?	-	-	-	-	-	.	-	-	-	-	
60.	Frankenthal	x	-	-	-	-	3	x	?	.	++	-	-	-	
61.	FT-Studernhm	-	-	-	-	-	x	-	-	.	.	-	-	-	

Appendix 1: Sites

No.	Place	La Tène	finds	graves	settlement	graves of the élite	finds	inscriptions	graves	villae	settlement	continuity	coin hoards	Celtic coins
a	b	c	d	e	f	g	h	i	j	k	l	m	n	
62.	Freilaubenhm	-	-	-	-	x	-	-	-	-	.	.	-	-
63.	Freinsheim	x	x	?	-	x	1	x	-	.	=	-	-	
64.	Frettenheim	-	-	-	-	x	-	x	1	VC&VR	++	-	-	
65.	Friesenheim	-	1	-	-	x	-	-	-	.	.	-	-	
66.	Fürfeld	-	-	-	-	-	-	-	1	VR	++	-	-	
67.	Fußgönnheim	x	x	x	-	x	>2	x	-	?	=	-	-	
68.	Gabsheim	x	-	x	-	-	-	x	1	VR	=	-	-	
69.	Gausalgesheim	x	x	-	-	x	-	x	1?	VR?	=	-	-	
70.	Gaubickelhm	-	x	-	-	-	-	-	2-4?	VR	+	-	-	
70a.	Gaubischofsh	-	-	-	-	-	-	-	2-3?	VR	++	-	-	
70b.	Gauheppenh	-	-	-	-	x	-	x	1-2	VR	++	-	-	
71.	Gaulsheim	-	-	-	-	x	1	x	-	.	+	-	-	
72.	Gauweinheim	x	-	-	-	-	x	-	-	.	.	-	-	
73.	Gensing	x	1?	-	-	x	-	x	1	VR	++	-	-	
74.	Gimbsheim	x	x	-	-	x	1	1	-	?	.	-	-	
75.	Gimmeldingen	-	-	-	-	-	-	x	x	VR	++	-	-	
76.	Göllheim	-	-	-	-	x	-	x	1	VR	++	-	-	
77.	Gönnheim	-	-	-	-	-	-	x	-	.	+	-	-	
78.	Grolsheim	?	-	-	-	x	-	x	-	.	.	-	-	
79.	GrBockenheim	-	-	-	-	-	x	-	-	.	.	-	-	C
80.	GrNiedersheim	-	-	-	-	x	x	-	-	.	+	-	-	
81.	GrWinternhm	x	x	x	-	x	-	x	3-6?	VR	=	1	I	
82.	Grünstadt	x	-	-	-	x	-	x	?	V/VC	++	-	-	F,H
83.	Gundheim	x	x	-	-	-	-	-	1	VR	=	-	-	
84.	Gundersheim	x	-	-	-	-	-	x	1?	VR?	++	-	-	
85.	Guntersblum	-	x	-	-	x	-	x	-	x	.	-	-	
86.	Hackenheim	-	x	-	-	x	-	x	-	x	.	-	-	
87.	Hahnheim	x	x	x	w	x	-	-	1-3?	VR	=	1	-	
87a.	Hamm	x	?	-	-	-	-	1	-	.	.	-	-	
88.	Hangenweishm	x	x	-	w	x	-	-	1	VR	=	-	-	
89.	Harxheim	x	1	-	-	-	-	-	-	-	-	-	-	
90.	Haßloch	-	x	-	-	x	-	x	-	.	=	-	-	
91.	Haßloch (NW)	-	-	-	-	x	-	x	-	x	++	-	-	
92.	Hechtsheim	-	-	-	-	x	1	x	1	VR	++	-	-	
93.	Heidesheim	x	x	-	w	x	-	x	2	VR	=	-	-	
94.	Heimersheim	x	x	-	w	x	4	x	?	?	=	-	-	

Appendix I: Sites

No. a	Place b												Coins	
		La Tène c	finds d	graves e	settlement f	graves of the élite g	finds h	inscriptions i	graves j	villae k	settlement l	continuity m	coin hoards n	Celtic coins
95.	Heppenheim (Ws)	x	x	-	W	x	4	x	>1	VR	=	-	-	
96.	Heßloch	-	x	-	w	x	-	x	-	x	=	-	-	
96a.	Heppenleidenhm	-	x	-	-	-	-	-	-	.	-	-	-	
97.	Heuchelheim	-	-	-	-	-	-	x	-	.	+	-	-	
98.	Hillesheim	-	-	-	-	-	x	-	-	?	.	-	-	
98a.	Hochborn	x	x	-	-	-	1	-	-	.	-	-	-	
99.	Hohensülzen	x	?	-	-	x	-	x	-	x?	+	-	-	
100.	Horchhm (Ws)	x	x	-	-	x	1	x	1?	VR?	=	-	-	
101.	Horrweiler	-	-	-	-	-	-	-	1	VR	++	-	-	
102.	Iggelheim	-	-	-	-	-	x?	-	-	.	.	-	-	
102a.	Ilbesheim	-	2	-	-	-	-	-	-	.	.	-	-	
103.	Ingelheim	-	-	-	w	x	1	x	3	VR	++	-	-	
104.	Jakobsweiler	-	-	-	-	x	-	x	-	.	++	-	-	
105.	Kallstadt	-	-	-	-	x	x	-	-	.	+	-	-	
106.	Kempton	x	-	-	-	x	-	x	1-2	VR	++	1	-	
107.	Kirchheim	-	-	-	-	-	2	x	-	.	++	-	-	
108.	Kirchhm-Bol.	-	-	-	-	x	-	x	-	.	++	-	-	
109.	Kl-Winternhm	x	x	?	-	x	>10	x	2	V&VC?	=	-	-	
110.	Köngernheim	x	x	-	w	-	-	-	1?	VR?	.	-	-	
110a.	Kreuznach	.	.	.	-	x	x	x	1	V&VR	.	-	-	
111.	Kriegsheim	x	x	-	-	x	-	x	-	x	=	-	-	
112.	LachenSpeyerd.	x	x	x	-	-	-	x	x	.	-	-	-	p
113.	Lambsheim	-	-	-	-	x	-	-	-	.	++	-	-	
114.	Laubenheim	-	-	-	-	-	6	x	3	VR	++	-	-	
115.	Leistadt	-	-	-	-	-	-	-	-	QU	.	-	-	
116.	Leiselhm (Ws)	x	-	x	-	x	-	x	?	VR	=	-	-	
117.	Lonsheim	-	1	-	-	.	-	-	-	.	.	-	-	
117a.	Lörzweiler	-	-	-	-	x	-	-	>1?	VR?	++	-	-	
118.	Mainz	-	-	-	-	x	x	x	-	VC	++	>10|	2B3C 8D2E3FGHL NOPQR2S2T	
119.	Marnheim	-	-	-	-	x	-	-	-	.	.	-	-	
120.	Marienborn	x	?	-	w	x	1	x	1?	VR?	+	-	-	F
121.	Maudach, Lu	-	-	-	-	x	2	x	-	x	++	-	-	
122.	Meckenheim	-	-	-	-	-	-	x	-	.	+	-	-	
123.	Mettenheim	x	x	x	sr	x	3	x	-	x	=	-	-	

Appendix 1: Sites

No.	Place										continuity	coin hoards	Celtic coins
		finds	graves	settlement	graves of the élite	finds	inscriptions	graves	villae	settlement			
a	b	c	d	e	f	g	h	i	j	k	l	m	n
124.	Mölsheim	x	x	-	W	x	-	x	-	x	=	-	-
125.	Mommenheim	x	x	?	w	x	2	x	1?	VR?	=	-	-
126	Monsheim	-	x	-	w	x	1	x	-	x	+	-	-
127.	Monzernheim	x	1	-	-	-	-	-x	1?	VR	=	-	-
128.	Mörstadt	-	-	-	-	x	-	-	-	-	.	-	-
129.	Mußbach	-	-	-	-	-	x	-	2	VR	++	-	-
130.	Mutterstadt	-	-	-	-	x	1	x	-	VC?	++	-	D
131.	Nackenheim	x	x	-	w	x	-	x	1-2	VR	=	-	-
132.	Neubamberg	x	-	-	-	x	-	-	-	x?	.	-	-
133.	Neuhsn (Ws)	-	x	-	-	x	2	x	-	.	=	-	-
134.	Neuhofen	.	.	.	.	x	-	x	-	?	.	1	-
135.	Neuleiningen	-	-	-	-	-	-	x	-	.	++	-	-
136.	Neustadt/W	-	-	-	-	-	5	x	-	.	++	1	-
137.	Ndrflörshm	-	-	-	-	x	-	-	-	.	.	-	-
138.	Ndrhilbershm	-	-	-	-	x	-	x	2	VR	++	-	-
139.	Ndr-Ingelheim	x	x	x	w	x	6	x	3?	VCVR	=	3	-
140.	Nieder-Olm	x	x	x	W	x	>10	x	x	VR	=	-	-
141.	Niederwiesen	-	-	-	-	x	-	-	-	.	.	-	-
142.	Nierstein	x	x	x	W	x	9	x	4	V&VC	=	-	-
143.	Oberflörshm	-	-	-	-	x	-	x	-	.	++	-	-
143a.	Oberhilbeshm	-	-	-	-	-	-	x	-	.	.	-	-
144.	OberIngelheim	x	x	-	-	x	x	x	?	VR?	=	-	-
145.	Ober-Olm	x	x	-	-	x	4	x	1?	VR?	=	-	-
146.	Obrigheim	x	x	x	-	x	-	x	2?	VR?	=	-	F
147.	Ockenheim	-	-	-	-	x	-	x	x?	VR?	++	-	-
148.	Offenheim	-	-	-	-	x	-	x	1	VR	++	-	-
149.	Offstein	x	x	-	-	x	2	x	-	?	=	-	-
150.	Oggershm, Lu	x	x	x	-	x	2	x	-	VC?	=	-	-
151.	Oppau	-	x	-	-	-	-	x	-	.	=	-	-
152.	Oppenheim	-	-	-	-	x	6	x	1	VR	++	-	-
153.	Osthofen	x	x	-	k	x	4	x	3	VR	=	-	C
153a.	Partenheim	x	-	-	-	-	-	-	5(?)	VR	++	-	-
154.	Pfeddershm, Ws	x	x	-	-	x	-	x	1?	VR?	=	-	-
155.	Pfifflichgm, Ws	-	-	-	-	-	-	x	-	.	+	-	-
156.	Planig	-	x	-	-	-	1	-	1	VR	=	-	-
157.	Pleittersheim	-	-	-	-	-	-	-	> 1?	VR	++	-	-

Appendix 1: Sites

No.	Place	La Tène		settlement	graves of the élite		Roman	inscriptions	graves	villae	settlement	continuity	coin hoards		Celtic coins
		finds	graves		finds	graves									
a	b	c	d	e	f	g	h	i	j	k	l	m	n		
158.	Quirnheim	-	-	-	-	-	-	-	1	VR	++	-	-		
159.	Ramsen	x	1	x	-	x	1	-	-	.	.	1	F		
160.	Rh'dürkhn, Ws	-	x	-	-	-	3	x	-	.	+=	-	-		
161.	Rh'gönnhm, Lu	-	-	-	-	x	3	x	-	x	++	1	2B,W		
162.	Rockenhausen	x	-	.	-	x	>3	x	1	VR	.	-	-		
163.	Rommersheim	-	x	-	-	-	-	-	-	.	-	-	-		
164.	Roxheim	-	-	-	-	-	-	2	-	.	.	-	-		
165.	Ruppertsberg	x	-	x	-	x	8	x	?	?	=	-	F		
165a.	St Johann	-	-	-	-	-	-	-	1?	VR?	.	++?	-		
166.	Sausenheim	x	-	x?	-	x	1	x	1?	VR?	=?	-	U		
167.	Schimsheim	-	1	-	-	-	-	-	1	VR	+	-	-		
168.	Schwabenheim	x	x	-	k?	x	-	x	1	VR	.	-	-		
109.	Schwabsburg	-	x	-	-	x	-	-	2	VR	+	-	-		
170.	Selzen	x	x	-	-	x	1	x	x	V/VC	=	-	-		
171.	Siefernheim	x	x	-	k	x	-	-	x?	x	=	-	K,L		
172.	Sörgenloch	x	x	-	-	-	-	x	-	-	=	-	-		
172a.	Spiesheim	x?	-	-	-	x?	-	-	-	-	.	-	-		
173.	Sponsheim	-	x	-	-	x	1	x	-	.	=	-	A		
174.	Sporkenheim	-	-	-	-	x	-	x	-	.	+	-	-		
175.	Sprendlingen	-	-	-	-	x	-	x	1-2	VR	++	-	-		
176.	Steinbockenhm	-	-	-	-	x	-	-	-	.	.	-	-		
176a.	Sulzheim	-	-	-	-	-	-	-	1?	VR?	++?	-	-		
177.	Udenheim	-	-	-	-	x	-	-	-	x?	.	-	-		
177a.	Uelvershm	-	x	-	-	-	-	-	-	-	-	-	-		
178.	Uffhosen	x	x	-	-	.	-	-	-	.	.	-	L		
179.	Undenheim	x	-	-	-	x	-	-	1-3?	VR	+	-	-		
180.	Ungstein	-	-	-	-	x	2	x	1	VR	++	1?	-		
181.	Unterinterstg	-	-	-	-	x	-	-	-	.	.	-	-		
182.	Volxheim	-	x	x	W	x	-	x	-	.	=	-	-		
183.	Wackenheim	x	x	-	w	-	-	-	1	VR	=	-1	-		
184.	Wahlheim	-	-	-	-	-	1	1	-	.	+	-	-		
185.	Wallertheim	x	x	-	-	x	-	x	-	.	=	-	-		
186.	Weinheim (AZ)	x	x	x	-	-	-	x	1?	VR?	=	-	-		
187.	Weinsheim, Ws	-	x	-	-	x	1	x	1	VR	+=	-	-		
188.	Weisenhm/Sand	-	-	-	-	-	1	x	-	.	++	-	PV		
189.	Wendelsheim	-	-	-	-	x	-	-	-	.	.	-	-		

Appendix I: Sites

No. a	Place b	finds	graves	settlement	graves of the élite	finds	inscriptions	graves	<i>villae</i>	settlement	continuity	coin hoards	Celtic coins
		La Tène c	d	e	f	g	h	i	j	k	l	m	n
190.	<i>Westhofen</i>	x	x?	-	-	x	-	1	-	-	.	-	-
191.	<i>Wiesoppenhm, Ws</i>	x	x	x	-	x	1	x	1?	VR?	=	-	K,3Q
192.	<i>Wolfsheim</i>	x	x	-	w?	x	-	x	1	VR	=	-	-
193.	<i>Wöllstein</i>	x	x	-	W	-	1	x	1	VR	=	-	-
194.	<i>Wonsheim</i>	x	x	?	k	-	-	-	-	-	--	-	E
195.	<i>Worms-Centre</i>	x	x	-	-	x	x	x	x	CC	=	3	F3G, 3H
196.	<i>Ws-Adlerberg</i>	x	x	x	-	-	-	-	-	.	--	-	-
197.	<i>Ws-Liebenau</i>	x	x	-	-	.	.	.	?	VR?	=?	-	-
198.	<i>Ws-Rheingewann</i>	x	x	x	k	-	-	-	-	.	--	-	-
199.	<i>Ws-Herrnsheim</i>	x	x	-	w	-	-	-	-	.	-	-	-
200.	<i>Ws-Hochheim</i>	.	.	.	.	x	-	-	-	.	.	-	-
201.	<i>Wörrstadt</i>	x	x	x	-	x	-	x	3-5	VR	=	-	2F
202.	<i>Zell</i>	-	-	-	-	-	-	x	-	.	+	-	-

*Appendix II**Prosopography of the Civitas Vangionum*

This appendix lists names from the *Civitas Vangionum*, together with profession, origin and, if part of a dedication, the name of the deity. Underlining indicates a name of Celtic origin or of possible Celtic origin according to Holder (1896) (volume and page number in brackets), or, if a suffix, is listed as Celtic in Schmidt (1957) (S41 for page 41).

place	name	CIL	Holder S=Schmidt (1957)	comment
Alzey				
	L. <u>Gnatus Mascellio</u>	6262	I2030,II450	to <i>dea Fortuna</i>
	[Se]cundius ...	6263		to Mercury and <i>Rosmerta</i>
	<u>Vitalinius Secundinus</u>	6264	III410, S41	to <i>dea Minerva</i>
	<u>Octonius Tertius</u>	6265	II832,II1800	<i>deae nymphis</i>
	- <u>Castonius Cassius</u>		III1141,(I832f)	<i>vicani</i> of Alzey
	<u>Attonius Lucanu[s]</u>	6266	I,276	to <i>dea Sul</i>
	Victorius Victor	6267/8	(cf III,283)	to Mercury
Alsheim				
	Faustinius <u>Faustinus</u>	6270	II1478, S41	<i>Coh I F(lavia)</i> <i>D(amascenorum)</i>
	- <u>Senaucus</u> Florionus			
	- Gemellinia <u>Faustina</u> mat(er)		S41	
	- Faustinia <u>Potentina</u> (soror)		S41	
Gimbsheim				
	L. Herenni	6271	(II120)	
Oppenheim				
	Felicius	6275		to Mercury
	- <u>Seccus</u> , <i>pater</i>		II1424f	
Nierstein				
	Julia <u>Frontina</u>	6272	(I,1500) S41	to <i>Sirona</i>
	Tertia	6282		
	- Venusti			
	- Gemelli			
	- <u>Serotine</u> Primia		(III1523)	
	- <u>Amilla</u>		II29f, S41	
	...	6276		to Mercury
	Fabricius	6280		
	- Acceptius	6280		
	- Paternia Priscilla	6280	S41	
	Lucania Victorina coniugi	6279		
	- Pervincius Romulus	6279		

Appendix II: Prosopography

place	name	<i>CIL</i>	Holder	comment
	...orius iii??	6278		<i>Coh I Ituariorum</i>
Dienheim	<u>Silius Attonis</u>	6277	(III548) I276	<i>Ala Picent.</i>
Erpolzheim/Isenach	(soldier)	6143		
	- <u>Prudentia Favorina</u>		S41	
Eisenberg	<u>Paterni (G)ratinus</u>	6144	(cf II954) S41	to <i>I.O.M.</i>
	- <u>Clemens</u>			
	<u>Giamonius Statutus</u>	6145	I2019 (II1636)	to <i>Mars</i> and <i>Victoria</i>
	<u>Lucios Cinonis</u>	6146	II300fI, 1020	to <i>Silvanus</i>
	<u>M. Adiutorius</u> Memor	11696	(cf III507f)	to <i>Mercury</i> and <i>Rosmerta</i>
	<u>M. Adiutorius</u> Memor	11698	(cf III507f)	
	<u>L. Maximin, v[eteranus]</u>	11697	-	to <i>Me[rcurius]</i>
	- <u>L. Felicius, v[eteranus]</u>		-	
	- <u>L. Leontius</u>		-	
Kirchheim	<u>L. Septimius Florentinus</u>	6147	S41	to <i>I.O.M.</i>
	<u>Sep[timia At]luqua</u>	11700	III741	
Donnersberg				
	-	6148		to <i>I.O.M.</i>
Rockenhausen	<u>Vitaliu[s] Pe[l]to</u>	6149	(III410)II964	to <i>Mercury</i>
	...olisa	6150		
	- <u>Iustus Liaeniui Ma...</u>	6150	(cf II214)	
towards Dörrenbach:				
	<u>Maturio (.) Serroni</u>	6151	II482f II1525	
	- <u>Manatiae(.)Vicerinae</u>	6151	II401 III277	
	<u>Secund[ini]</u>	11708	(cf II427)	
Landstuhl				
	Diss. Cassibu. <u>Matunus</u>	6153	II481f	dedication
	<u>Cacirus D[e]geddus</u>	6154	III1028	
	- <u>Billiccedna</u>	6154	I421	
	- <u>Magissa</u>	6154	II378, pannonisch, S41	
	<u>Melaus</u>		II531f	
	<u>Diddignatus</u>	11701	missing in Holder, S41	
Becherbach, Roßberg				
	<u>Massuinnus</u>	6156	(II455) S41	to <i>Mercury</i> <i>cusius armorum</i>
	- <u>Irduus, pater</u>		II70	
	<u>Q. Seius Postumus</u>	6157		to <i>Mercury</i> and <i>Maia</i>
Becherbach				
	<u>Sollemnia Iuste</u>	6158		
	- <u>Honoratius Sanctus</u>	6158		
	- <u>S[oll]e[m]nia Iustina</u>	6158	S41	

Appendix II: Prosopography

place	name	CIL	Holder	comment
Odenbach				
	<u>Bellius</u>	6159	I391	
	- Suavis, <i>pater</i>	6159	II1659:Suausia	
	- Novia Postumus, <i>uxor</i>	6159		
Heidenburg				
	<u>April(la)</u>	6162	II167, S41	
	Quin...	6163		
	- Lu[p]ul(a)c		S41	
	<u>Poppausius</u> Cossteioni	11703	II1036	
Wolfstein				
	<u>Attonia</u> Selma	6175	I276	
	- Nicco <u>Attonis</u> filio		I276	
	- Quintus			
	- Saturnina		S41	
	- <u>Carantus</u>		I770f	
	...ianonis...	6176a		
	<u>Caran(tus)</u>	6176a	I770f	
	...ometius	6176a		
St Julian				
	<u>Oclatius</u> Maritus	6177	(cf II830)	
	- Lucius			
	- <u>Rundo</u>		II 1247	
	- <u>Materna</u>		II 460.468	
	<u>Sextus</u>	6178	(II1534ff)	
	- Perpetua			
	<u>Sextino</u>	6179	(II1534ff),S41	
	<u>Sextino</u>	11706	(II1534ff),S41	
	- <u>Sextus</u>		(II1534ff)	
	- Perpetua		-	
Oberstaufenbach, Heidenburg				
	Axsinia <u>Ammula</u>	6184	S41	
	- Mariano		-	
	<u>Cacirus</u>	6185	I670:Cacuros	
	- [Ia]nuaria	6185	-	
	...aiaus	6187	-	
	Visionius Iasus	6190	-	
Rehweiler				
	Sex(tus) <u>Cottius Tasgillus</u>	6194	II144ff.II1749f	to Mercury
Kusel				
	Val. Ambii...	6195	-	
	Domitianus	6195	-	
	[T]ib(erius) <u>Candidiannius</u> Tacitus	6197	Candidus:I733	
	- Tib <u>Candidianus</u> Iunianus, <i>frater</i>		Candidus:I733	
	<u>Catullini</u> Iusti Uppilii...	6198	I,850ff	

Appendix II: Prosopography

place	name	CIL	Holder	comment
Schwarzerden				
	Cinnene	6201	-	
	- Tertius Tertinu[s]	6201	S41	
	Iaretio Losunio patri	6202	II13	
Lichtenberg, St Wendel				
	Matutinus	6204	S41	to <i>I.O.M.</i>
	- Victor		-	
Kefersheim, St Wendel				
	[Me]rcator	6205	-	dedication
Idar, Birkenfeld				
	M. Aventinius Honoratus	6208	-	
	- Av[entini]a Victorina M[...]		S41	
Dhaun				
	M. Pannonius Solu(tus)	6211	-	<i>praefectus</i>
Ober-Olm				
	Securius Carantus, leg XXII	7248	(II1427)I770f	to <i>I.O.M.</i> and <i>ceteri di deaque</i>
	L. Bittius Paulinus	7249	I430 (II959)	to Mars and Victoria
	...	7250		to Mars Leucetius
	Aur(?) Candidus	7250	I733	<i>cornicularius</i>
Klein-Winternheim				
	L. Iulius B...	7252	-	<i>Mars-Leucetius</i> temple
	A. Didius Gallus	7253	-	to <i>dea Nemetona</i>
	P. Flavoleius P.F. Poinutina Cordus		-	
		7255	-	<i>mil leg XIV</i>
	- C. Vibennius L.F.	7255	-	
	Primanus Primulus, leg XXII	7256	(cf II1043f), S41	
	- Augustalinia Afre		-	
	- Lucania Summula		S41	
	- Augustalinus Afer		S41	
	- Primania Primula		S41	
	Marcellina Marcella	7257	S41	
	- Iul Paterninus, dec ala Ind		(cf II952f), S41	
Ebersheim				
	Lindis; (Velandu); Thudelindi	7260	-	
Borbetomagus				
	C. Barburius Festus, praef	6212	-	to <i>I.O.M.</i>
	L. Octavius Celer, praef	6213	-	to <i>I.O.M.</i>
	Pistillus	6214	II1009, S41	to <i>I.O.M.</i>
	- Quintus		-	
	- Maianus		II388	
	Q. Vinilius Pervincus	6215	notCeltic:II352	to <i>I.O.M.</i>
	-	11708c	-	to <i>I.O.M.</i>
	Intamelus Ebuuro	6216	II402	to <i>I.O.M.</i> and <i>Iuno</i>
	- Firmia Lucia		-	

Appendix II: Prosopography

place	name	CIL	Holder	comment
	<u>Mallius</u> Sofio	6217	Mallo:II397	to <i>I.O.M.</i> and <i>Iuno</i>
	Novia <u>Prisc(a)</u>	6218	Prisciaca:II1044f	to <i>I.O.M.</i> and <i>Iuno</i>
	Victorina <u>Primitiva</u>	6219	S41,Primi-:II1043f	to <i>I.O.M.</i> and <i>Iuno</i>
	...	6220		to <i>I.O.M.</i> and <i>Iuno</i>
	Amandus	6221		to <i>Mars Leucetius</i> from Deva
	- <u>Velugnus</u>		III155	
	L. Servandius Quietus	6222	-	to Mercury and <i>Rosmerta</i>
	Caesonius Liberalis, veteran	6223	-	to the <i>Parcae</i>
	Ti... G...	6224	.	to <i>Deo Sucellu</i> and <i>Silvanus</i>
	L/T Romanus Respectus	6225	-	to <i>Victoria</i>
	-	6226f	-	dedication
	<u>Argiotalus</u>	6230	I213f	from Nantes, <i>ala Indiana</i>
	- <u>Smertulitanus</u>	6230	II1593f	
	Aur Dizza	6231	Thracian	<i>leg II Part</i> , from Thrace
	- (Aur?) Muc...		-	
	- Aurel Pyrr(us)		-	
	Aurelius <u>Vapinus</u>	6232	III102, S41	<i>circitori</i>
	- Aurel Flavinus, <i>contubernali</i>		(cfII496f)S41	
	Q Carminio Ingenuo	6233	etrusk?	<i>Ala Hisp.</i>
	- Sacer Iulius...			
	Licinus	6234	-	<i>Helvetius; Ala Hisp.</i>
	- <u>Clossi</u>		II046	
	- Tib Iul Capito			
	<u>Partus</u> , natione Treveri	6235	II950	<i>Ala Agrippiana</i>
	- <u>Mutius</u>		II665	
	M. Sempronius L.F. Domo Terrestinus	6236		<i>Ala Sebos.</i>
	Val Maxantius	6238	-	<i>numer. kata[fract.</i>
	- Val Dacus Fr		-	
	Val Rom...	6239	-	<i>ci(ves) Te(xander)?</i>
	Veigertus Sisgi F, natus Monet(ium)	6240	-	<i>coh raeto</i>
	C. Vibius C.F. Volt <u>Virillus</u>	6241	III383ff, S41	<i>leg XV</i>
	Vindol F., coh raetor	6242	-	
	Leubius Claupi F.	II709	-	<i>ala Sebosiana</i>
	- Claupus		-	
	- Gratus			
	C. Candid(i)us <u>Martinus</u>	6243	I733, S41	<i>sevir Augustali</i>
	- Severia Severa, <i>coniux</i>		(Seva:II1531)	
	- Candida Martinia Dignilla		(II4466ff)	
	C. Lucius Victor	6244		<i>dec civ. Vang</i>
	- Victor <u>Florentinus</u>		(cf: II497)	
	- <u>Victorinus</u>		S41	
	Fausta	6245		
	Q. <u>Cellius</u> Firmus	6246	(cf I887)	
	- Iulia, <i>uxor</i>			

Appendix II: Prosopography

place	name	CIL	Holder	comment
-	Victor			
	<u>Oclavia</u>	6249	II829	
-	Amanda		-	
-	<u>Lasionius Firminus</u>		II149: Lassonius, S4 1	
Seve(rius) <u>Lupulus</u>		6250	(cf: II349f), S41	
-	<u>Severius Florentinus, frater</u>		(Seva-: II1531), S41	
-	<u>Licontius</u>		II212	
Spectatia Peregrine		6251	-	
-	Servandius <u>Sollemnis, filius</u>		(cf II1608)	
-	Servandia Servanda		-	
Spectatia Spectata		6252	-	
-	<u>Luttonius Lupulus</u>		II355, S41	
T. Flavius Respectus		10021,69	-	
Viatorius Quintianus		11709a	(cf II1063)	
-	Felicia <u>Felicula</u>		S41	
<u>Maternus</u>		11708d	(cf II460)	
S. <u>Senecianus Micio</u>		NT 115	II1473 II583	
-	Pacata		-	
...Jania Delibria		NT117	-	
-	...ridia, <i>mater</i>		-	
Aldvalvhi, Ludino, Rutillo		6254ff	-	
Ws Neuhausen				
	Lupulus Lupercus, <i>Dr Art Calc</i>	6247		
-	<u>Novionia Motuca, mater</u>		II793,II647	
-	Lupulus Lupianus			
	<u>Martia Marcellina</u>	6248	(cfII446), S41	
Ws Weinsheim				
	T. <u>Tummoni</u>	6237	II1985	
-	<u>Albisia, coniugi</u>		I86, S41	
-	T. Restitutus		(cfII1178)	<i>mil leg XXII</i>
Ingelheim				
	L. Antonius L.F.	7499	-	
	Septiminius	7501	-	
?, <i>coh III Aquit.</i>		11959	-	<i>to I.O.M.</i>
Bingen, Bingerbrück				
	Patron[i]us Patrinus	7502	(cf II955?)	<i>to I.O.M.</i>
-		7503	-	<i>to I.O.M.</i>
	C. Hostilius <u>Saturninus</u>	7504	(cf II1376ff, S41	
-	Hostilia <u>Alpina</u>		S41	
Primia Accepta		7505	-	<i>to I.O.M.</i>
-	Privati Secund[i]nus		S41	
-	<u>Tertinus</u>		II1799, S41	
-	Con[...]nis		(cf II1089ff)	
L. Fabius L.F. Galeria Fabius		7506	-	<i>leg IV Mac</i>
-	Anicius Modestus		-	

Appendix II: Prosopography

place	name	CIL	Holder	comment
	<u>Annaius Daverzus</u> , <i>coh III delmat</i>	7507	III628;illyr;cfII1244	
	- <u>Pravauius</u>		II1041	
	Batus, <i>natione Ditione</i>	7508	(cf I360)	<i>coh IIII delmat</i>
	- Dasantus		-	
	Beusas	11962	-	<i>coh IIII delmat</i>
	- <u>Suttus</u>	=7509	II 1683	
	Breucus, <i>natione Breucus</i>	7510	-	<i>coh I Pan.</i>
	- <u>Blaedarus</u>		I443	
	<u>Scenus</u>	7511	(II1397?)	<i>coh I Pan.</i>
	- <u>Assenio</u>		I443	
	Biddu[...]	7512	-	
	- ...]astor		-	
	Hyperanor	7513	-	<i>coh I Sag.</i>
	- Hyporanor		-	
	Tiberius Iulius Abdes	7514	-	<i>coh I Sag.</i>
	C. Iulius Hastaius	7515	-	<i>coh Sag.</i>
	Deccavi	7516a	?	
	-			
	L. <u>Cominis</u> Q. F. <u>Pollentinus</u>	7517	(II1073?), S41	
	Ma]crina	7518	S41	
	<u>Focuronia</u>	7519	II499	
	- <u>Patta</u>		II956	
	- <u>Lutoria Bodic[ca]</u>		II354,I457	
	Iulia Quintia	7520	-	
	- Tib Iul Severus		-	
	- Tib Iul <u>Eunus</u>		(cf II483)	
	C. Vescius	7521	-	
	- C. Vescius C. F. Sevrus		-	
	- <u>Peregrina</u>		S41	
	- G. Vescius G. Lib. Varrus		-	
Kreuznach				
	-	7528	-	to I.O.M.
	-	7529	-	to I.O.M.
	-	7530	-	<i>Iuno, Mercurius, Hercules, Fortuna</i>
	Caluisia <u>Secundina</u>	7531	S41	to Mars
	<u>Masclius Sattus</u>	7532	(cfII452),II1378	to Mercury and <i>Maia</i>
	-	7533	-	to Mercury and <i>M[aia]</i>
	M. Cirrius Secundius	7534	-	
	Claudia Accepta Socra	7535a	-	
	- Iulius Spectatus		-	<i>leg XXII</i>
	- Solemnia Severa		-	
	M. <u>Adiutorinus Adiut</u>	7535b	(cf III508)	
	<u>Sacerille</u> Luculla	7536	II1277, S41	

Appendix III

Coinage

The following table, that forms the basis for Figure 12, was compiled using the information given in *Fundmünzen*.

The 'average' is compiled from the total number of coins found at Worms, Alzey, Mainz, Bingen, Köln, Speyer, Rheinzabern, and Dalheim. In comparing the average with the distribution of coin loss of a specific site, that site does not contribute to the average.

Although the general approach was inspired by R. Reece (e.g. 1972) various changes were necessary because in this case the beginning of Roman occupation, rather than its end, had to be analysed; this especially affects the division of the periods, which needed a further subdivision in the earlier centuries.

Longer periods are possible from the middle of the third century onwards, resulting in the following:

Ia	pre-Augustan (not used in the statistics)	VIIb	AD 180–193
Ib	Augustus and Tiberius	VIII	AD 193–222
Ic	Caligula	IXa	AD 222–238
II	AD 41–69	IXb	AD 238–275
III	AD 69–96	XII'	AD 275–306
IV	AD 96–117	XIII'	AD 306–337
V	AD 117–138	XIV'	AD 337–364
VI	AD 138–161	XVb	AD 364–388
VIIa	AD 161–180	XVI	AD 388–402

There were certain problems, especially with the entry 'Worms. Stadtkreis' in *Fundmünzen*, where coins from sites outside the city district or from hoards could not be separated from the individual finds, causing, for example, almost 54 per cent of all coins to date to AD 238–275. This would have distorted the statistics if I had not separated it by making a division before and after AD 238. For similar reasons, the pre-Augustan coins, especially those from the Greek world, had to be ignored as it is unknown how many of them were actually purchased and not found.

The number and origin of the Celtic coins are given in Appendix I.

Appendix III: Coinage							
		Wormsgau		Mainz		Alzey	
Ia	pre-Aug	(277	17.14%)	(93	5.90%)	(13	5.96%)
Ib	Aug+Tib	167	12.69	570	38.46%	33	16.10%
Ic	Caligula	24	1.82	69	4.66%	3	1.46%
I	pre-AD 41	191	14.51%	639	43.11%	36	17.56%
II	41–69	71	5.39%	204	13.77%	16	7.80%
III	69–96	169	12.84%	164	11.07%	24	11.71%
IV	96–117	133	10.11%	101	6.82%	29	14.15%
V	117–138	133	10.11%	64	4.32%	17	8.29%
VI	138–161	109	8.28%	75	5.06%	30	14.63%
VIIa	161–180	143	10.87%	74	4.99%	23	11.22%
VIIb	180–193	37	2.81%	16	1.08%	9	4.39%
VIII	193–222	166	12.61%	94	6.34%	12	5.85%
IXa	222–238	164	12.46%	51	3.44%	9	4.39%
		(total: 1316)		(total: 1482)		(total:205)	
IXb	238–						
X	–275	3884	53.62%	295	13.22%	157	15.37%
XI	275–						
XII'	–306	253	3.49%	85	3.81%	35	3.43%
XII	294–						
XIIIa	317–						
XIII'	–337	644	8.89%	178	7.97%	233	22.82%
XIIIb	330–						
XIV	348–						
XIV'	–364	610	8.42%	137	6.14%	119	11.66%
XVa	364–					272	26.64%
XVb	–388	397	5.48%	51	2.28%		
XVI	388–402	139	1.92%	4	0.01%		
		(total: 7243)		(total: 2232)		(total:1021)	

Appendix III: Coinage

		Bingen (<i>castra/vicus</i>)		Speyer		Rheinzabern	
Ia	pre-Aug	6	(1.99%)	22	(5.67)	11	(2.21)
Ib	Aug+Tib	78	26.35%	91	24.86%	58	11.96%
Ic	Caligula	16	5.41%	16	4.37%	14	2.89%
I	pre-AD 41	94	31.76%	107	29.23%	72	14.85%
II	41-69	28	9.46%	37	10.11%	44	9.07%
III	69-96	56	18.92%	34	9.29%	55	11.34%
IV	96-117	38	12.84%	31	8.47%	52	10.72%
V	117-138	24	8.11%	27	7.38%	40	8.25%
VI	138-161	21	7.09%	42	11.48%	59	12.16%
VIIa	161-180	16	5.41%	45	12.30%	60	12.37%
VIIb	180-193	4	1.35%	10	2.73%	13	2.68%
VIII	193-222	9	3.04%	14	3.83%	51	10.52%
IXa	222-238	6	2.03%	19	5.19%	39	8.04%
		(total: 296)		(total: 366)		(total: 485)	
IXb	238-275	116	20.68%	85	10.49%	58	7.06%
XII'	275-306	32	5.70%	40	4.94%	15	1.83%
XIII'	306-337	51	9.09%	184	22.72%	119	14.49%
XIV'	337-364	38	6.77%	53	6.54%	87	10.60%
XVb	378-388	22	3.92%	82	10.12%	57	6.94%
XVI	388-402	6	1.07%				
		(total: 561)		(total: 810)		(total: 821)	

Appendix III: Coinage

		Köln		Dalheim - Ricciacus		Nida - Vicus	
0	Celtic	11		21		3	
Ia	pre-Aug	11		12		13	
Ib	Aug+Tib	73	35.44%	39	10.00%	27	2.91%
Ic	Caligula	17	8.25%	3	0.77%	2	0.22%
I	pre AD 41	90	43.69%	42	10.77%	29	3.13%
II	41–69	22	10.68%	25	6.41%	23	2.48%
III	69–96	23	11.17%	39	10.00%	209	22.55%
IV	96–117	14	6.80%	32	8.21%	161	17.37%
V	117–138	10	4.85%	33	8.46%	101	10.90%
VI	138–161	14	6.80%	51	13.08%	134	14.46%
VIIa	161–180	13	6.31%	51	13.08%	87	9.39%
VIIb	180–193	6	2.91%	15	3.85%	33	3.56%
VIII	193–222	7	3.40%	59	15.13%	98	10.57%
IXa	222–238	7	3.40%	43	11.03%	52	5.61%
		(total: 206)		(total: 390)		(total: 927)	
IXb	238–275	204	19.94%	412	15.60%	49	5.01%
XII'	275–306	11	1.08%	128	4.85%	1	0.10%
XIII'	306–337	197	10.75%	445	16.85%	1	0.10%
XIV'	337–364	194	18.96%	570	21.58%	0	0.00%
XVb	378–388	211	20.63%	696	26.35%	0	0.00%
		(total: 1023)		(total: 2641)		(total: 978)	

Appendix III: Coinage

		average from all sites (excl. <i>Nida</i>)		(average\[\i{Worms}\]) and (average-\[\i{Worms}\])		(average\[\i{Alzey}\]) and (average-\[\i{Alzey}\])	
Ib	Aug+Tib	1109	23.37%	27.57%	- 14.88	23.7%	- 7.60
Ic	Caligula	162	3.41%	4.02%	- 1.59	3.5%	- 2.04
II	41-69	447	9.42%	10.95%	- 5.56	9.49%	- 1.69
III	69-96	564	11.88%	11.50%	1.34	11.89%	- 0.18
IV	96-117	430	9.06%	8.65%	1.46	8.83%	5.32
V	117-138	348	7.33%	6.26%	3.85	7.29%	1.00
VI	138-161	401	8.45%	8.50%	0.22	8.17%	6.46
VIIa	161-180	425	8.95%	8.21%	2.47	8.85%	2.37
VIIb	180-193	110	2.32%	2.13%	0.68	2.22%	2.17
VIII	193-222	412	8.68%	7.16%	5.45	8.81%	- 2.96
IXa	222-238	338	7.12%	5.07%	7.44	7.25%	- 2.86
(=4746)							

		(average\[\i{Mainz}\]) and (average-\[\i{Mainz}\])		(average\[\i{Bingen}\]) and (average-\[\i{Bingen}\])		(average\[\i{Köln}\]) and (average-\[\i{Köln}\])	
Ib	Aug+Tib	16.51%	21.95	23.17%	3.18	22.82%	12.62
Ic	Caligula	2.85%	1.81	3.28%	2.13	3.19%	5.06
II	41-69	7.44%	6.33	9.42%	0.04	9.36%	1.32
III	69-96	12.25%	- 1.18	11.42%	7.50	11.92%	- 0.75
IV	96-117	10.08%	- 3.26	8.81%	4.03	9.16%	- 2.36
V	117-138	8.70%	- 4.38	7.28%	0.83	7.44%	- 2.59
VI	138-161	9.99%	- 4.93	8.54%	- 1.45	8.52%	- 1.72
VIIa	161-180	10.75%	- 5.76	9.19%	- 3.78	9.07%	- 2.76
VIIb	180-193	2.88%	- 1.80	2.38%	- 1.03	2.29%	- 0.62
VIII	193-222	9.71%	- 3.40	9.06%	- 6.02	8.92%	- 5.52
IXa	222-238	8.79%	- 5.35	7.46%	- 5.43	7.29%	- 3.89

Notes

- 1 La Tène chronology follows Polenz (1971).
- 2 Cf. Stümpel (1955), but cf. Heinzel (1971) for the more recent excavation of a Celto-Roman settlement near *Mogontiacum*.
- 3 Reche (1934) is an extreme representative of such a period.
- 4 F.M. Illert (1936: 29).
- 5 Cf. Millett (1990: 7 f.).
- 6 Millett (1990: 57–9).
- 7 Cf. Tac. *Ann.* XII, 27.
- 8 Bernhard (1990a: 49).
- 9 Also cf. Bloemers (1983: 159), Roymans (1990: 3), Okun (1989) for concepts on assimilation, ‘acculturation’ and processes of interaction.
- 10 Tac. *Germ.* 28.
- 11 (1955).
- 12 This concept is heavily rejected by Nierhaus (1966).
- 13 Traditionally the *Treveri* are regarded as the founders of *Borbetomagus*, cf. Zorn (1570: 1 ff.).
- 14 Cf. Nierhaus (1966).
- 15 Tac. *Germ.* 28.
- 16 *RE* SXV, 661.
- 17 Holder III: 99.
- 18 Schmidt (1957: 151; 1958).
- 19 Nierhaus (1966: 4 ff.).
- 20 Nierhaus (1966: 219).
- 21 (1938: 132).
- 22 (1953).
- 23 Cf. n. 13.
- 24 Hommel (1940: 157).
- 25 Nierhaus (1939: 10).
- 26 Zangenmeister decided to exclude the area of Bingen and Bad Kreuznach from the *civitas Vangionum*, although he could not assign it to any other *civitas* (*CIL* XIII, 178 f.).
- 27 This follows Bernhard (1990a: 108) and Bannert (1978: 654).
- 28 But cf. Arnold (1854: 9): Mainz, although archbishopric at that time, was even part of the Wormsgau as late as AD 822. Approximately seventy-five per cent of all Roman inscriptions from Mainz (as published in *CIL*), and an even higher percentage for its hinterland, are related to military personnel who originated from all over the Roman Empire and thus cannot provide us with data on the native society.
- 29 Amongst the latter we could count the *Vangiones* who had already fought together with Caesar at Pharsalus, if we can believe Lucan. *Phars.* I 430 f.
- 30 Cf. Drinkwater (1983: 108).
- 31 Cf. also Bernhard (1990a: 46).
- 32 Cf. Bernhard (1990a: 52).
- 33 Cf. Stein (1932: 288 f.). Legions based in Mainz and Mainz-Weisenau. From 13 BC : *leg XIV Gemina*, *XVI (Gallica)*; from AD 9 to AD 17 in addition: *II Augusta*, *XIII Gemina*; from AD 39/40 in addition to the 14th and 16th legion: *IV Macedonica*, *XV Primigenia*. Since AD 43: *XXII Primigenia* and *IV Macedonica*; from AD 71: *XIV Gemina* and *I Adiutrix*, enforced from AD 83 by *XXI Rapax*. Since AD 92 *XXII Primigenia* only.
- 34 *CIL* 6231. 6237. 6241; to the tile stamp ‘*leg XXII C.V.*’, indicating a base in the *civitas*, cf. Ritterling (1924/5: 1809–10).

- 35 Polyb. 6, 39, 13; Rivet (1969: 195 f.).
- 36 Cf. Bernhard (1990a: 19).
- 37 Cf. Kromayer-Veith (1928: 495.510 f.).
- 38 *CIL* VII: 1193. 1195.
- 39 Bernhard (1990: 68).
- 40 Cf. Bernhard (1990a: 69).
- 41 Kromayer-Veith (1928: 510 f.).
- 42 *CIL* VII, 588. 1002. 1003. 1193. 1195.
- 43 Cf. ch. 6 and Bittel et al (1981: 81)
- 44 Cf. e.g. Bernhard (1990a: 105 f.).
- 45 Rivet (1969: 204).
- 46 *CIL* 6225.
- 47 *CIL* 11696/8.
- 48 *CIL* 6244.
- 49 *CIL* 6243.
- 50 *CIL* 3693.
- 51 Among that vast amount of inscriptions of *Lugdunum*, as published in *CIL* XIII, there are five occurrences of *aedilis*, four of *quaestores*, and around sixty of *seviri Augustalis*, but only four of *duumviri*.
- 52 (1990: 66 f.).
- 53 The size of the *ordo* is taken from known constitutions. The relatively large number can be argued for because firstly, the more *decuriones* the more income a city had (admissions fee for council and philanthropy), secondly, a large *ordo* had the advantage of accepting (Rome friendly) 'new comers' in the élite, and perhaps, the number of (known) *villae rusticae* in this *civitas* might reflect a large number of councillors.
- 54 Cf. e.g. *Lex Irnitana* ch. 19 ff., 26 f., B, C.
- 55 leRoux and Guyonvarch (1990: 201), Dumézil (1958: 11); Marti (1959: 10); Caes. *BG* 6, 13, 1.
- 56 leRoux and Guyonvarch (1990: 187 f.); Schmidt (1991: 426).
- 57 *CIL* 6243.
- 58 *CIL* 6247.
- 59 A similar situation occurred in the Greek *poleis*, although their constitutions usually remained unchanged, so that there were fewer direct changes except for the introduction of a provincial governor and the emperor. And yet Plutarch tells us that '...the entire local government loses its authority.' (*praec rei publ ger* 815a).
- 60 Cf. Pekáry (1968).
- 61 Cf. e.g. Loewenstein (1973: 377 f.).
- 62 Such as the constitution of *Urso*, the so-called *lex coloniae Genetivae Iuliae* or *lex Ursonensis* (44 BC) (ch. 70), cf. *CIL* II, 5439; *Diz. Epigr.* 4, 1957, 727–8.
- 63 For Aosta, Walser describes the rise from slave to *duumvir* and member of a senatorial family in just three generations (1989: 70 ff.).
- 64 Stümpel (1967b: 347); cf. Rivet (1969: 203); von Petrikovits (1980: 41).
- 65 Millett (1990: 20 ff. 35).
- 66 Cf. Rivet (1969: 184).
- 67 Bittel et al (1981: 81).
- 68 Dehn (1951); Bittel (1981: 6 f.).
- 69 For the following cf. Bittel (1981).
- 70 Dehn (1961).
- 71 Bittel (1981: 14.21).

- 72 Bittel (1981: 21).
- 73 Bittel (1981: 18).
- 74 Millet (1990: 66).
- 75 Cf. also Bittel et al (1981: 82).
- 76 Cf. Bernhard (1990a: 42).
- 77 Cf. Bittel (1981: 21).
- 78 Cf. Chantraine (1965: 570).
- 79 (1955).
- 80 Also M. Grünewald, pers. comm.
- 81 Cf. Oldenstein-Pferdehirt (1983: 304).
- 82 Cf. Millett (1990: 50 f.).
- 83 Cf. also Grünewald (1986: 25).
- 84 Frenz (1990: 206).
- 85 Cf. Frenz (1990: 206 f.).
- 86 *CIL* XIII, 6244.
- 87 Arnold (1854: 11).
- 88 *Amm. Marc.* XV 11, 8.
- 89 (1990: 91). 'LPRIA', abbr. for Late Pre-Roman Iron Age.
- 90 Rivet (1958).
- 91 Percival (1976: 135).
- 92 Also cf. Rivet (1969: 199).
- 93 (1967b: 340 ff.).
- 94 Stümpel (1978).
- 95 (1967b: 347).
- 96 Millett (1990: 91 f.).
- 97 Cf. Stümpel (1986: 1990).
- 98 With so-called 'soul-holes' in the bottom; cf. Grünewald (1990: 281).
- 99 Cf. Haffner (1989a: 114 ff.).
- 100 Cf. Grünewald (1990: 38. 118 ff. 281).
- 101 Grünewald (1990: 38). But it is a common phenomenon in Etruscan burials.
- 102 Haffner (1989b-c).
- 103 Cf. Haffner (1989a: 118).
- 104 *CIL* XIII, 6243.
- 105 *CIL* XIII, 6225.
- 106 *CIL* XIII, 6145.
- 107 *CIL* XIII, 6252.
- 108 Cf. also Heichelheim (1932: 2385 f.).
- 109 Cf. also Weinstock (1935: 2535).
- 110 *CIL* XIII, 6212-6220.
- 111 *CIL* XIII, 6212.
- 112 *CIL* XIII, 6213.
- 113 *CIL* XIII, 6214; *CIL* XIII, 6217.
- 114 Cf. Ziegler (1979), Heichelheim (1932: 2274); 'I.O.M. Tanaro' from Chester.
- 115 *CIL* VII, 168 (= *RIB* 452); cf. also *CIL* III, 2804: *Iuppiter Taranucus*.
- 116 Cf. Usener (1869: 32).
- 117 Cf. *CIL* XIII, 6148.
- 118 Cf. Heichelheim (1932: 2279 f.).
- 119 von Kienle (1938: 276 ff.).

- 120 Haug (1924: 689); cf. Heichelheim (1940: 220–2) and especially Bauchhenß and Noelke (1981: 83).
- 121 Cf. Bauchhenß and Noelke (1981: Karte 1).
- 122 Cf. Bauchhenß and Noelke (1981: 83).
- 123 Even Hommel accepts this (1940: 162).
- 124 *CIL* XIII, 6221. 6221a.
- 125 Cf. Cüppers (1979).
- 126 Cf. Stähelin (1931: 499 f.).
- 127 *BG* 6, 17.
- 128 *CIL* XIII, 6118. 6347.
- 129 *CIL* XIII, 6222. 6263. 11696.
- 130 *CIL* XIII, 7532.
- 131 *CIL* XIII, 6149.
- 132 Grünewald (1986: 58).
- 133 *CIL* XIII, 6224.
- 134 *CIL* XIII, 6224. 6146.
- 135 *CIL* XIII, 6223.
- 136 *CIL* XIII, 6272.
- 137 From the 22nd November AD 223; *CIL* XIII, 6265.
- 138 ‘Celtic’ and ‘indigenous’ for Scharf (1938: 106 ff.), since many of his non-Celtic, ‘Germanic’ names can be proved to be typically Celtic, if we follow Szabó (1983).
- 139 Cf. Szabó (1983).
- 140 *CIL* XIII, 6231f.
- 141 *CIL* XIII, 6238. 6239.
- 142 *CIL* XIII, 10021, 69.
- 143 Cf. also Szabó (1983: 12).
- 144 *CIL* XIII, 6217.
- 145 *CIL* XIII, 6280.
- 146 *CIL* XIII, 6243, also 6197.
- 147 *CIL* XIII, 6225.
- 148 *CIL* XIII, 6244.
- 149 (1983: 9).
- 150 In order of appearance: *CIL* XIII, 6217. 6214. 6275. 6175. 6230. 6214.
- 151 Szabó (1983: 19).
- 152 *CIL* XIII, 6175. 6248. 7257. 6263. 6264; NT115; cf. Szabó (1983: 16–19).
- 153 *CIL* XIII, 6251; NT115.
- 154 Cf. Szabó (1983: 16. 19); *CIL* XIII, 6215. 6158. 6264.
- 155 *CIL* XIII, 6244; cf. Szabó (1983: 16).
- 156 *CIL* XIII, 6270. 6247. 6265. 6243. 6267. 6268.
- 157 (1983: 28 f.).
- 158 As Benabou did for North Africa (1976: 533 ff.).
- 159 The dating follows Scharf (1938) who provides a rough date for a relatively large amount of inscriptions, although he leaves out some with, in his opinion, typically non-Germanic names.
- 160 *CIL* XIII, 6246.
- 161 In the second century, approximately seven per cent soldiers, as seen from Fig. 9.
- 162 Cf. Meyer (1990: 79 f.).
- 163 In the *civitas Vangionum*, for example, *CIL* XIII, 6147. 6157. 6194. 6197. 6208. 6215. 6222. 6225. 6233. 6243. 6244. 6246. 6262. 7249. 7250.

- 164 E.g. *CIL* XIII, 6143. 6154. 6187. 6192. 6243. 6251. 6252.
- 165 *CIL* XIII, 6197.
- 166 On the epigraphic habit cf. Meyer (1990: 79 f.).
- 167 Künzel (1990: 194–5).
- 168 Cf. examples in Scharf (1938).
- 169 (1938: 109).
- 170 Cf. Nierhaus (1939: 94)
- 171 *CIL* XIII, 6235. 6234. 6231.
- 172 Cf. Grünewald (1990: 49).
- 173 Cf. Böhme-Schönberger (1990: 54–9).
- 174 Cf. Nuber (1972).
- 175 Bittel et al (1981: 79).
- 176 Rivet (1969: 185).
- 177 Millett (1990: 98); Rivet (196: 188 f.).
- 178 Bernhard (1990a: 46); Haffner (1989d: 75–6).
- 179 Cf. Frankenstein-Rowlands (1978: 76).
- 180 Cf. Rivet (1969: 200); Bernhard (1990a: 25).
- 181 Cf. Weckerling (1919).
- 182 *CIL* XIII, 6250.
- 183 Cf. Rivet (1969: 177 f.).
- 184 Cf. Groenman van Waaterling (1983: 147 f.).
- 185 Millett (1990: 98).
- 186 Cf. Bernhard (1990b).
- 187 Cf. Bernhard (1990b: 361).
- 188 Stümpel (1991: 153).
- 189 Cf. Allen (1980).
- 190 Forrer (1908: 183 ff. fig. 351 ff.).
- 191 (1978: 662).
- 192 Cf. Haffner (1989c: 183 f.).
- 193 Scheers (1977: 179 ff.).
- 194 Cf. Franke (1960: 205, N°1148).
- 195 Tac. *ann.* I 17, 4.
- 196 Kromayer and Veith (1928: 525).
- 197 Cf. also Wierschowski (1984: 112–15).
- 198 But cf. Crawford (1970).
- 199 Cf. Rivet (1969: 182–4).
- 200 Translation by Prof. J. Wilkes, Institute of Archaeology, London.
- 201 Cf. von Petrikovits (1980: 62).
- 202 Cf. von Petrikovits (1980: 61).
- 203 Cf. Grünewald (1986: fig. 52).
- 204 Cf. Heger (1980: 49).

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The Roman 'Frontier' in Morocco

by JOHN SPAUL

The part of Morocco that was occupied by the Romans consisted of a triangular area between Tangier, Volubilis and Rabat (Fig. 1). On the west is the Atlantic Ocean; on the east beyond the Rif Mountains is the Mediterranean Sea; to the south the land is open, apart from the Forest of Mamora which spreads itself between the sea and the Oued Beth, one of the tributaries of the Oued Sebou. This river, the Sebou, is the second longest in North Africa, and, like the Nile, was subject to periodic flooding which spread a layer of alluvial soils over a flat and featureless area known as the Rharb. To the south of the Rharb, among a complex of hills but still some hundred kilometres north of the Middle Atlas, a fertile plateau accommodates the city of Volubilis. The other main towns were Tingis (modern Tangier), on the Straits of Gibraltar, Zilil, between Tingis and Lixus (the latter at the mouth of the Oued Loukkos), Banasa and Thamusida on the banks of the Sebou and Sala at the mouth of Oued Bou Regreg. There are two roads described in the *Antonine Itinerary*: one was described as a coastal road, from Tingis through Zilil, Lixus, Banasa, Thamusida to Sala, and the other, an interior road, from Tingis through Oppidum Novum, Tremulae, Vopiscianae and Gilda to Volubilis and Tocolosida.

The idea of a fixed frontier delimiting the area of a province does not seem to have really taken root in the thinking of the emperors before the time of Hadrian. He is credited with the establishment of a wall in Britannia 'from sea to sea' and with a *limes* in the desert zone of Numidia. He probably also approved of a fixed Rhine-Danube *limes*. What his policy was, in Mauretania Tingitana, a small, distant and unimportant province governed by an equestrian without the benefit of a legion, is unknown. Hadrian does not seem to have visited the province, though he might have made a side-trip from Spain; there is no literary evidence for his policy towards Morocco.

During the greater part of the Roman occupation of Morocco, namely from Hadrian to the withdrawal to the northern sector, say from AD 120 to 282, the relationship between the Empire and the local people appears to have been peaceful. There is no archaeological evidence for any destruction in any of the southern cities of Mauretania Tingitana—Volubilis, Sala, Banasa, Thamusida—such as might have been caused by a hostile invasion. Instead there appears to have been a period of continuous peace. The evidence for this is provided by the series of 'treaty altars' from Volubilis, which have been published and commented on. Among the first commentators, Jérôme Carcopino pointed out that 'the abundance of the altars was a disagreeable index of the fragility of the peace which they are believed to

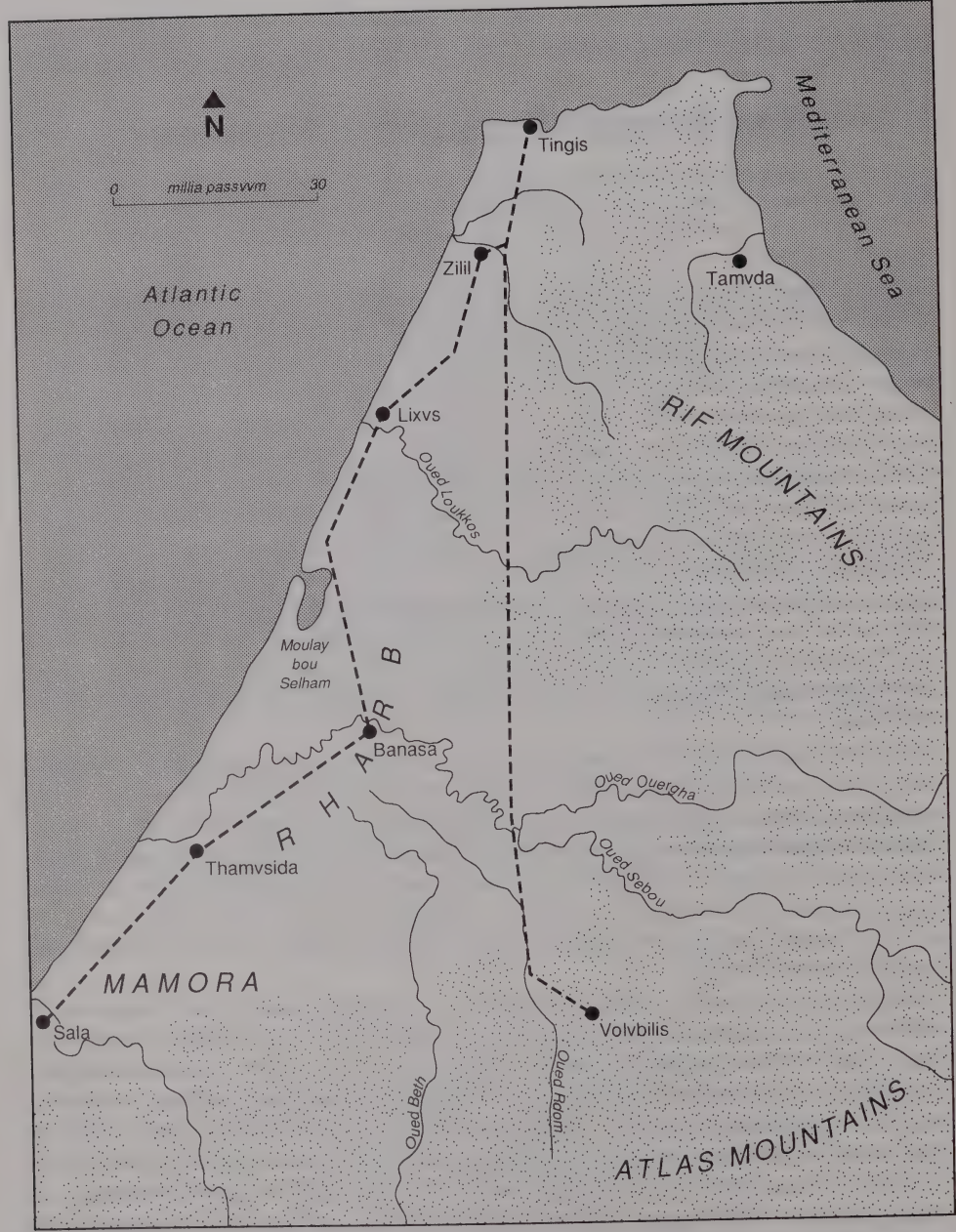


Fig. 1 Mauretania Tingitana.

symbolise' (1943: 272). In 1945, Raymond Thouvenot suggested that these stones were to commemorate a peace treaty following a war. In 1957, Edmond Frézouls credited Rome under Marcus Aurelius with reasserting its dominance first by fortifying Volubilis and then by breaking the alliance of Baquates and Macennites. It was also thought that a ceremony like this should have been performed annually, resulting in many such stones. If there were only a few, it was *prima facie* evidence for a state of hostility when a treaty altar was not set up, or for a period of hostility which had been ended by the new treaty.

A summary of the altars and tribes could be tabulated thus:

Year	Emperor	Chieftain	Tribe	Reference
173	Marcus Aurelius	unknown	unknown tribes	AE 1941, 115
173/5	Marcus Aurelius	Ucmetio	Macennites & Baquates	AE 1957, 202
180	Commodus	Canarta	Baquates	AE 1957, 203
200	Severus and sons	Ililasene	Baquates	AE 1957, 204
	Severus Alexander ?	unknown	unknown	AE 1946, 602
	Severus Alexander	unknown	Bavares & Baquates	AE 1946, 52
239	Gordian III	unknown	Baquates	AE 1957, 201 and AE 1953, 42
241	Gordian III	unknown	unknown	AE 1952, 43
245	Philip	Sepemazyne	Baquates	AE 1954, 110
277	Probus	Iulius Matif	Baquates	ILMaroc 46
280	Probus	Iulius Nuffuz	Baquates	AE 1921, 23
to which one could add				
140	Antoninus Pius	Tuccuda	Baquates	AE 1931, 65

From this information I deduced the following propositions at the time of the Fourth Congress of Roman Frontier Studies at Durham, in 1959:

1. That a new meeting and invocation was only needed whenever there was a change of party, either a new emperor or a new chieftain, prince or king, or a new grouping of tribes. In each of these cases, a ratification of the existing state of affairs was achieved by holding a conference and dedicating an appropriate stone.

The two stones of the reign of Probus name different negotiators, Nuffuz on behalf of his father Julius Matif, and after Matif's death, Mirzi on behalf of his brother, the new king, Julius Nuffuz.

The two stones which date from the reign of Marcus Aurelius and the pair dating from the reign of Severus Alexander probably record an alteration in the grouping of the external tribes; unfortunately the names of the leaders on three of the stones are missing, and one stone has completely disappeared.

2. That the state of affairs between the Roman authorities and the local external tribes was constant and peaceful; recognition of a change in the tribal leadership was automatic.

3. That a fixed frontier never existed in Mauretania Tingitana because the relationship between the Romans and an external tribe was based on the system of treaty-renewals.

4. That the linear 'frontier' found in 1922 by H. Rouland-Maréchal in the neighbourhood of Sala (= Rabat) (Euzennat, 1989: 129–53) was never intended to be part of a fixed frontier, but was a municipal boundary.

A certain amount of movement between winter and summer pastures continues among the tribes of the hill-country, and there is no reason to think that this situation did not exist in the Roman period. Nevertheless, the presence of the town of Volubilis with a civilisation pre-dating the Roman occupation, and the settled nature of the arable farming on its plateau implies that these seasonal migrations did not impinge upon the territory of the Volubilitans.

Since 1959 when I put these propositions forward, I have not had any reason to change my opinion except in one instance. I now think that these inscriptions record a change in the native dynasty; the reasons for this will become clear at a later stage. The main proposition, that in Tingitana there was no conflict with the native tribes, is still valid. In fact the archaeological evidence from Volubilis suggests that there was never any time when the people of the town and its territory felt threatened by the Bavares, Macennites or Baquates. Maurice Lenoir (1989: 91–3) listed the comments made by various scholars on the supposed 'ravages of war in human terms'; he pointed out that the horrific destruction imagined by some was deduced from the statue-base of Marcus Valerius Severus and a horizon of burnt material separating pre-Roman and Roman layers found in the excavation of Temple C at Volubilis. The excavator's 'perhaps' became the historian's 'almost certainly', and an 'area near the forum' became the 'central quarter'. He pointed out, in fact, that the charcoal layer covers only eight square metres and is only two centimetres thick, while the surrounding area shows no burning whatsoever.

On the other hand, the city of Volubilis was provided with a wall described by Maurice Euzennat (1989: 210), as one of the most well-known and best preserved of the walls of North African cities. It would seem logical to suppose that this wall was built to defend the city from a barbarian attack, though there is no evidence that it was ever attacked. The demolition of sections of the wall at a later stage was probably the result of the need of the inhabitants of the nearby settlement of Moulay Idris for building material. But if the city was never attacked, why should the wall have been built about the year 168?

One probable answer to this question was fear of the plague which returned with Lucius Verus to Rome from the Near East in 166. The effect of this epidemic was most severe on Rome and the army though it was not a factor in the decline of the Roman Empire. There was much legal activity as a result of this episode, and towns which wanted walls were required to seek imperial permission (Ulpian, *Digest* 50, 10, 6). Whether the council of Volubilis did so is not known, but as the procurator was named on the building-stones (IAM2, 382, and 383), it is probable that permission was sought and granted. In this way the governor and the council of Volubilis could prevent the entry of plague victims and ensure that the city remained free of the epidemic.

Since the inscriptions relating to the Baquates and their allies were first found, they have been studied frequently and provided the framework for many studies of barbarian incursions into Tingitana. Marlene Sigman (1977: 431) for example, believed that the colloquium inscriptions showed that the 'Baquates repeatedly raided Roman settlements and remained in

an almost constant state of unrest' because the Romans chose to ignore the Baquates' pasture rights. Edmond Frézouls (1980) criticised this supposition, pointing out that the Baquates were not a state, and as such could not have a treaty with Rome. Yet when a change of chieftain occurred, his successor was not bound by previous arrangements until they had been confirmed. Since the Roman state was a state and therefore a continuous entity, it was unnecessary to confirm the treaty whenever a new procurator was appointed, or even a new emperor. This is a change from his earlier view of 1957 when he suggested that there were often crises in Tingitana foreign relations, which made it necessary for the Romans to act. Under Marcus Aurelius the Romans reacted to the federation of Macennites and Baquates (1957: 115) by 'brissant la fédération naissante et en s'assurant la docilité de la nouvelle dynastie baquate.' He envisaged further military manoeuvres under Gordian III and suggested that the main attack on the Romans in Tingitana came not from the Baquates but from the tribes whose names appeared least on the inscriptions.

Maurice Euzennat (1985) returned to 'Les Troubles de Maurétanie' giving much the same impression; that relations between the Romans and the local tribes were strained and wars were frequent. He suggested that the grant of citizenship to Tuccuda in 140 showed that calm had returned, and he cited the inscription of M. Sulpicius Felix from Sala (IAM2, 307) as evidence of a state of affairs near Rabat in 140, which he believed continued into the nineteenth century.

Géza Alföldy (1985) listed no fewer than nine occasions on which he claimed there was conflict between the Empire and the tribes of Mauretania, though he did not specify which took place in Tingitana and which in Caesariensis. The impression which he gave was that both parts of Mauretania were involved in all the events.

The 'colloquium inscriptions' were studied and revised by Ginette Di Vita-Evrard (1987). She underlined the idea that the texts recorded a renewal of the alliance at a change of partners, and she divided them into two groups, the first group invoking the Spirit of the Emperor, and the second, dedicated to Jupiter for the safety and welfare of the Emperor. Parallel with this was a change in formula, from 'conlocutus cum ...' in the first group to 'conloquium cum ... habuit pacis firmandae gratia' in the second.

Summarising the available information about the leaders of the local tribes, we have the following table where the letters of the title correspond to the letters on the inscription. [Numbers refer to *Inscriptions Antiques du Maroc*, tome 2, *Inscriptions Latines*]

No.	Year	Negotiator and Title
376	140	Aelius Tuccuda, Princeps gentis Baquatium
348	173	unknown (Aelius Uretius ?), Princ gentium I-----
384	173/5	Ucmetius, Princeps gentium Macennitum et Baquatium
349	180	Aurelius Canarta, Princeps constitutus genti Baquatium
350	200	Ililasene, Princ gentis Baquatium filius Ureti princ g. eiusdem
356	226	-elius
402	232/4	unknown, -----gentis Bavarum et Baquatium
357	239	unknown, Princeps g----s Baquatiu-

358	241	unknown, ----- -ium
359	245	Sepemazine, P. g. Baquatium
360	277	Iulius Nuffuz, filius Iul. Matif. Regis g.Baquatium foederata
361	280	Iulius Mirzi, frater eiusdem Nuffusis

There are some peculiarities in this list; firstly Aelius Tuccuda does not appear to have a *praenomen*. This could be either Titus if he was formally adopted by T. Aelius Antoninus Pius, or Publius if he was adopted by P. Aelius Hadrianus. I incline to the latter because on the stone there are two 'P's (Fig. 2) where there could have been three; the first two of the three would stand for the final part of the imperial title, 'Pater Patriae', and the third for Publius, the *praenomen* of the dedicator.

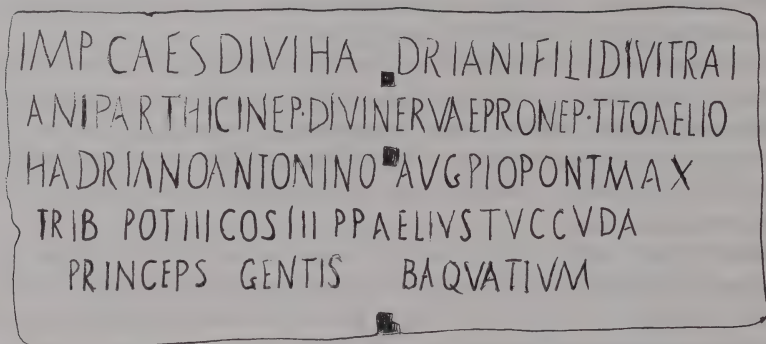


Fig. 2 IAM2, 376 = AE 1931, 65.

Even an experienced stonemason might omit one of three successive identical letters.

I am encouraged in this idea by the statement in Cassius Dio that 'the barbarians...even employed Hadrian as a mediator in their disputes.' He does not indicate which barbarian tribes were involved, but it would be reasonable for a dispute among the Baquates to be submitted to Hadrian for arbitration, and the chosen prince to be adopted into the imperial family as P. Aelius Tuccuda. Soon after his adoption, which probably preceded by a few weeks the death of Hadrian and the accession of Antoninus Pius, the Baquatian leader would arrange for a suitable inscription to be cut and placed in the forum of Volubilis. It is equally possible that the choice was made by the governor on behalf of Hadrian, and this might explain why the post was held by a senator, Uttedius Honoratus, instead of the usual equestrian *procurator pro legato*.

It would seem that after thirty years or so, the family of Aelius Tuccuda lost its primacy among the Baquates. IAM2, 348 has unfortunately been lost so there is now no way of checking for the missing letters (Fig. 3).

I have, however, restored the name of Aelius Uretius in the place where it could appear and added a date since the final line gives the names of the consuls according to Michel Christol and Andreina Magioncalda (1989: 172).

GENIO IMP
M·AVRELI ANTONINI AVG
P·AELIVS CRISPINVS PROC
CONLOCVTVS CVM
VRETIO PRINC GENTIVM B
AQVATIVM AD III ID MAIA
SEVERO TET POMPEI AVTICOS

Fig. 3 IAM2, 348 = AE 1941, 115
= CIL viii 21826.

Very shortly afterwards, two years at the most, the hegemony passed to another family who were originally from the Macennites, and for a short period, some seven years, one Macennitan chieftain led the two tribes. His name and that of the procurator Epidius Quadratus appear on IAM2, 384 of 173–5 (Fig. 4).

But in 179–80, a change occurred, and the Macennitan chief disappeared. Who was to lead the Baquates was the question which then arose. Following the precedent set in the reign of Hadrian, the tribe asked the emperor to choose their new leader. For this special purpose, an experienced equestrian, D. Veturius Macrinus was despatched from his senior-to-governor post to decide the Baquatian leadership. The result of his deliberations, as recorded on IAM2, 349 of 180 (Fig. 5), was in favour of Canartha who was adopted into the Aurelian family, and allowed to send his son, Memor to go to Rome, either as a hostage or as a student or both. At the early age of 16 unfortunately, Memor died and his epitaph (CIL vi 12800 = ILS 855 = AE 1941, 118) was found at Rome in the nineteenth century.

PRO SALVTE IMPE
RATORIS CAESARIS
M·AVRELI ANTONIN
AVG ARMENIACI
MEDICI PARTHICI
GERMANICI MAX
EPIDIVS QVADRATVS
PROC EIVS CONLOCVT
CVM VCMETIO PRIN
CIPE GENTIVM MA
CENNITMETBAQVA
TIVM

Fig. 4 IAM2, 384 = AE 1957, 202.

GENIO IMP L·AVR·COMMODI
AVG·SARMATICI GERMANICI
PRINCIPIS·IVVENTVTIS
D·VETVRIVS MACRINVS
PROC·AVG·CONLOCVTVS
CVM CANARTA PRINCIPIS CON
STITVTO GENTIBAQVATIVM
III·IDVS OCTOBRIS PRAESENTE
ETTI CONDIANO COS·

Fig. 5 IAM2, 349 = AE 1957, 203.

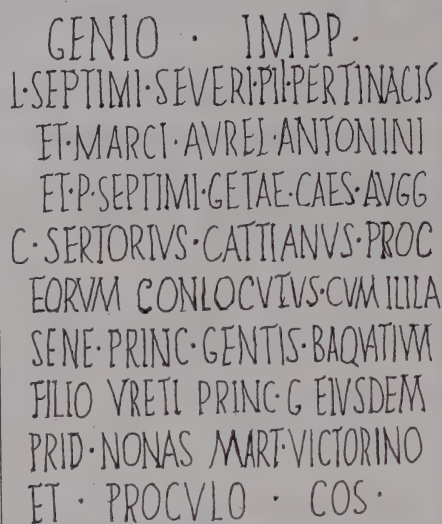
The reason for suggesting that Macrinus' career was interrupted is because direct promotion from Tingitana to Egypt was very unlikely, yet he was prefect of Egypt in 181. If in 179, Macrinus was already prefect of the Corn Supply his next post would automatically have been prefect of Egypt. The tenure of the governorship of Tingitana did not have to last three to five years but it could have been a six-month posting to deal with a particular situation as here. As he describes himself as *proc. Aug.*, and not *proc. Aug. proleg.*, he may have been an 'ad hoc *proc.*' rather than a provincial governor—many governors of Tingitana are described as *proc. Aug. prolegato*.

The dynasty of the Aurelian princes does not appear to have lasted long. Within a short time, at most twenty years, Canarta died without a successor from his family. Ililasene described himself as the son of 'Uretius, princeps gentis Baquatium', by which he denies any connection with the Macennites (Fig. 6).

Though Uretius and Ililasene may have been the son and grandson of Tuccuda, the latter does not appear to have used the name Aelius. But, equally, the absence of the name 'Aurelius' suggests that Canarta's family was dispossessed and the rule had reverted to an earlier family line.

Another change of tribal dynasty is signalled by the next recorded inscription after a gap of some twenty years. Three fragments of the left hand side of an inscription nearly two metres long, (IAM2, 356), give only part of the names of the two men involved. But the length of the inscription (Fig. 7) suggests that another tribe had assumed the hegemony, which continued until the final years of Severus Alexander. The *Historia Augusta* life of Severus Alexander, notoriously unreliable in its details, related that '...actae sunt res feliciter et in Mauretania Tingitana per Furium Celsum' but this need not indicate a punitive expedition in Tingitana. Discussing this, Edmond Frézouls (1957:109) wrote:

...notre texte 7, (i.e. IAM2, 402) dédié 'pour le salut de Sévère Alexandre', a de grandes chances de dater lui aussi d'une des dernières années de l'empereur: 232, 233 ou 234, et s'il ne mentionne pas expressément de victoire, il atteste du moins l'érection d'une *ara pacis* et la présence en Tingitane d'un procureur *pro legato*—signe d'un renforcement militaire.



GENIO · IMPP ·
L·SEPTIMI·SEVERI·IMP·PERTINACIS
ET·MARCI·AVREL·ANTONINI
ET·P·SEPTIMI·GETAE·CAES·AVGG
C·SERTORIVS·CATTIANVS·PROC
EORVM CONLOCVTVS·CVM·ILLIS
SENE·PRINC·GENTIS·BAQVATIM
FILIO VRETI PRINC·G·EIVSDEM
PRID·NONAS MART·VICTORINO
ET·PROCVLO·COS·

Fig. 6 IAM2, 350 = AE 1953, 80
= AE 1957, 204.

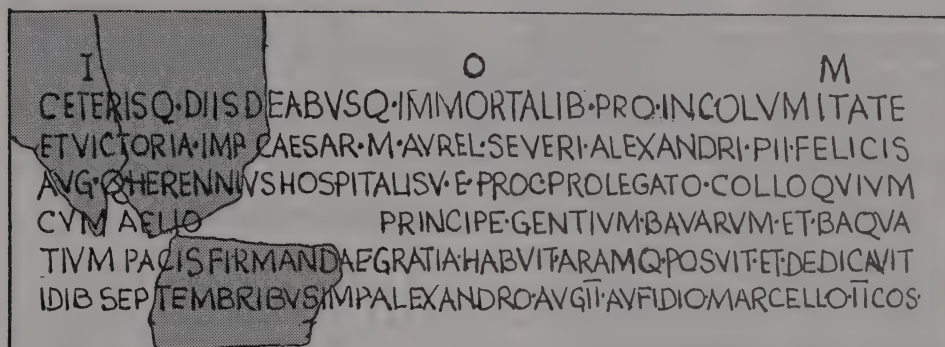


Fig. 7 IAM2, 356 = AE 1966, 602

As many of Tingitana's Roman governors are also *Proc. pro legato* it is hardly likely that this title implied the presence of reinforcements either auxiliary or legionary. It is much more probable that *pro legato* distinguished the procurator-governor from the merely financial or administrative procurator (Fig. 8).

The fragmentary inscription (IAM2, 402) of the final years of Severus Alexander has room only for a short name such as Furius Celsus—a name like Sallustius Macrinus is far too long for the space—and it may be that Furius Celsus, otherwise unknown, was a procurator-governor of Tingitana; but that he had legionary troops to defeat a barbarian invasion, is wholly unwarranted.

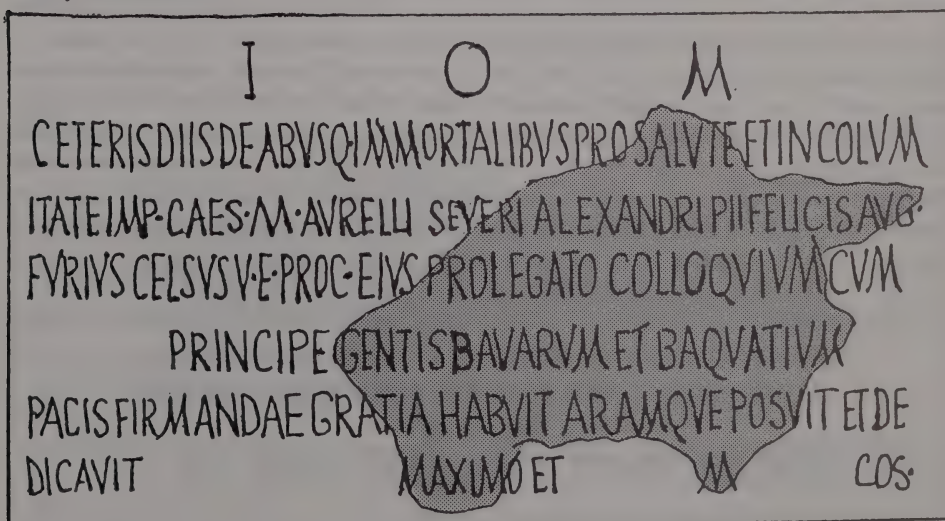


Fig. 8 IAM2, 402 = AE 1942/43, 54 = AE 1946, 52

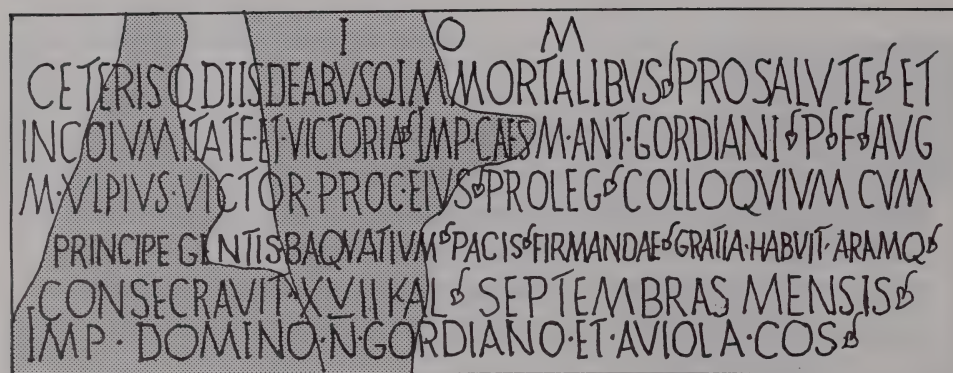


Fig. 9 IAM2, 357 = AE 1953, 77 (= AE 1957, 201) + AE 1952, 42

The reconstruction of the inscription, IAM2, 357, shows that by AD 239, the position had been reversed and the Baquatian chieftain was now paramount (Fig. 9). His name is missing, but he should have taken his name from the imperial family and have been an Antonius. Two years later, as IAM2 358 shows, he had been replaced, but the names of the governor and the tribal leader are both missing.

Four years later (Fig. 10, IAM2, 359 dated to 22 April AD 245), his place had been taken by Sepemazine who presumably led another family of the Baquates. He should have been enrolled among the Roman citizenry by the emperor, Marcus Julius Phillippus, in the Julian family since his successors, Julius Matif and Julius Nuffus claimed membership of that family.

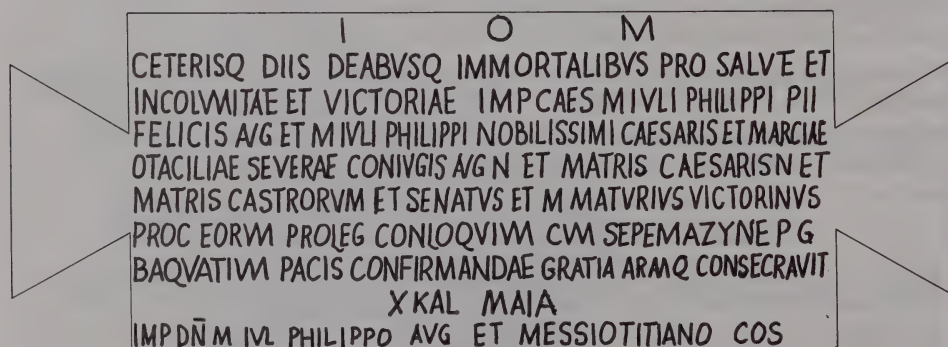


Fig. 10 IAM2, 359 = AE 1954, 110

I O M
 GENIO ET BONAE FORTVNAE
 IMP·CAES·M·VR·PROBI PIO
 INVICTI AVG N
 CLEMENTIVS·VL·MARCELLINVS
 V·P·PRAESES·PMT CONLOQVIO
 HABITOCVM·IVLNVTTZ·FILIOMLMTIF
 REGISGBAQFOEDERATA PACI
 ARAM STATVIT ET DEDICAVIT·DIE VIII
 KAL·NOVEMBR·D·N·PROBOAVGETPALINOCS

Fig. 11 IAM2, 360 = ILM 46

IO M DIIS DEABVSQVE IMMOR
 TABVS ET GENO·IMP CAESARIS
 MAREL FELICIS AETERNI AVG
 OB DIVTINA PACE SERVATA·GM
 IVLIO NVFFVSI ET IVNC CONLO
 QVIO HABITO·GM·IVL MRZ
 FRATE EIIVSDEM NVFFVSI SPG
 BAQVATVM
 CLEMENTVAL MARCELLINVS
 V·P·P·M·T·GN·F·M·TAPACISARA
 M·POV·T·BED·CA·T·BV·S·AR·IUB
 MESSALA ET GRATO COS

Fig. 12 IAM2, 361 = AE 1921, 23

The final inscriptions belong to the closing governorship of Clementius Valerius Marcellinus. The first (Fig. 11, IAM2, 360 dated to 24 October AD 277), follows the pattern set by the previous stones in the series. The last, IAM2 361 dated to 13 April AD 280, is notable for some odd ligatures and the phrase 'ob diutina pace servat[a]', a phrase which echoes another often used on the stones 'paci confirmandae gratia', and suggests that this peace had been long-lasting and would continue (Fig. 12).

I much regret the determination with which French scholars have tried to find a Roman frontier in Morocco. Maurice Euzennat recognised the local nature of the ditch and rampart south of Rabat and discounted the attempt by Raymond Thouvenot to trace a frontier road from that ditch and rampart to the Oued Beth. Summarising Raymond Thouvenot's (1956 and 1957) articles, he commented 'Sorti de la banlieu de *Sala*, on ne retrouve pourtant sur son tracé aucun vestige antique, et elle ne mène à aucune agglomération romaine connue; elle serait donc une voie stratégique importante' (1957: 250). One can trace in this last phrase a belief that you cannot make bricks without straw. Later (1989), however, he tried to show that the province quickly became a defensive outpost of the rich Spanish provinces, a *limes*, a frontier territory distanced from the rest of Africa; two sections in his book are headed 'Le *limes* de Sebou' and 'Le *limes* de Volubilis'.

Since Benjamin Isaac showed in 1988, that the word *limes*

1. was used in the first century to describe a military road in Germany, and
2. from the late first to third centuries, was an indication of a demarcated land border but not a series of military structures, nor frontier organisation nor a river boundary, and
3. from the fourth century onwards was the designation of a frontier district under the

command of a *dux*. The use of the word *limes* should always be accompanied by a definition. On any of these definitions the use of the term *limes* in connection with Tingitana should be discouraged.

Moreover, the Oued Sebou must have been an unsatisfactory frontier because in the Roman period it probably did not exist as a river much beyond the port of Banasa. Until 1927, when it was drained, the lower reaches of the Sebou were areas of marsh land, at times a large lagoon or a dangerous quagmire. In 1963, 180,000 hectares of land in this area were flooded; if, in Roman times, this area was a lagoon, that would explain the complete absence of Roman occupation sites in the area between Banasa and the present coast as well as the fact that Banasa was situated, according to the *Antonine Itinerary*, on the coast.

Maurice Euzennat's '*limes de Volubilis*' consists of nine towers and four fortresses around the major town of Volubilis. To describe this defended area as a *limes* during the third century, however, is a misuse of the term. Furthermore the town of Sala is beyond the frontier which could be represented by the Oued Sebou, yet was clearly part of the province of Tingitana before and for a short time after the Diocletianic reorganisation of the Empire.

Maurice Euzennat's attitude to Raymond Thouvenot's 'frontier road' is matched by Benjamin Isaac's attitude to Thomas Parker's 'Desert Frontiers'. Reviewing the latter's publication, he was highly critical of attempts to turn a north-south road through Jordan into a fortified frontier against desert nomads. This suggests that a comparison between the situation in Tingitana and the desert frontier in Syria would be profitable to both sets of scholars.

The idea of a linear frontier is neither impressive nor helpful in a discussion of the situation in Tingitana; it is much safer to think of Tingitana as a 'two-road province'. One-road provinces, such as Cilicia, are acceptable since the duty of the governor in such a province was to ensure the safe passage of goods and people along that road. Similarly in Tingitana there was a need to maintain the lines of communication between Tingis and the existing Roman colonies planted by Augustus along the coast, as well as the romanised communities of the interior. The job of the procurator-governor was to maintain the traffic on these two roads and this was achieved by having a large number of auxiliary units stationed along them. At its greatest the army of Tingitana had a nominal strength of 9,500 men while the total population of Volubilis and its territory was, according to Maurice Euzennat, between 30,000 and 40,000. The total population of the province would therefore have been in the region of 100,000, and a garrison of 9,500 lends support to Michael Speidel's (1991) comment, that 'in Mauretania Tingitana, the army had a greater impact than in most provinces.' Only a very rash chieftain would have been prepared to face an army of that size.

The basic premise behind this study is that the province of Mauretania Tingitana was almost uniformly peaceful throughout its existence and was completely peaceful from the arrival of the first procurator-governor until the decision was taken to evacuate Volubilis around AD 282. Not only is there no serious evidence of any conflict inside the province, but a study of the known governors shows that most of them were mediocrities whom no emperor would have entrusted with the command of a province in which there was likely to be trouble.

The names of 40 governors are known, but the careers are fully or partly known in only 14 cases. One of these was a senator, Sextus Sentius Caecilianus, whose post was administrative

and exceptional. One equestrian governor, Publius Besius Betuinianus, was a brilliant soldier, judging by his decorations, but he died in post; possibly his health had been undermined in the Dacian wars and this was a consolation or retirement post. Another, Aulus Scantius Larcianus, was an ex-centurion who retired to his native town in Italy. Of the remaining 11, three went on to the great prefectures, Marcus Gavius Maximus to the praetorian prefecture, Quintus Baienus Blassianus to the prefecture of Egypt and Caius Iulius Pacatianus to the prefecture of Mesopotamia; I have discounted a fourth future prefect, Decimus Veturius Macrinus, since his was an 'ad hoc' posting. Three more, Lucius Seius Avitus, Publius Aelius Crispinus and Aurelius Ianuarius, went on to govern Mauretania Caesariensis; two, Quintus Caecilius Redditus, and Caius Censorinus Niger, to govern Noricum; Titus Varius Priscus went on to govern Raetia; another, name unknown, became procurator of Belgica and the Two Germanies; and Luceius Albinus was assassinated. None of the other 25 governors is mentioned in any other source, so their influence on events outside Tingitana is unrecorded, and probably unremarkable.

This sketch of Tingitana (Fig. 13), based on a computer-aided model of north-west Morocco, despite the vertical exaggeration of 20 times, or perhaps because of it, reveals the extent of the Roman province and cultivated area of Tingitana. Looking from the north-west at an angle of 80 degrees to the horizontal, one can trace the course of the two roads, the coastal road from Tingis to Sala through Lixus, Banasa and Thamusida as well as the interior road to Volubilis. The Roman preoccupation with trade and prosperity means that the primary duty of the procurator-governor was to ensure that traffic on the two roads was unencumbered. To do this he had a large number of soldiers, and no need of a frontier to define his area of responsibility.

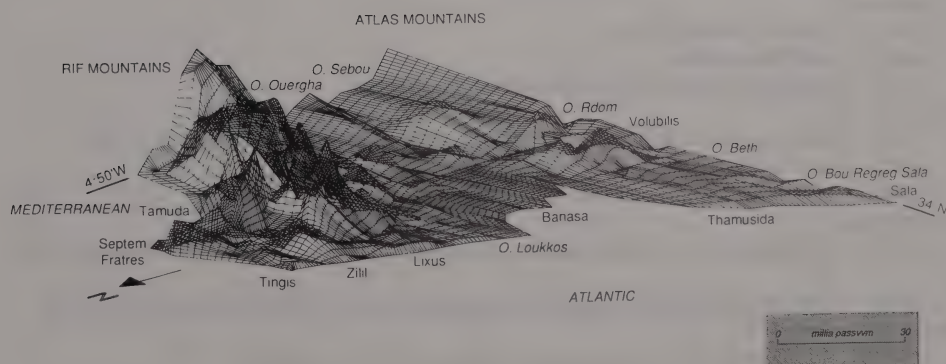


Fig. 13 Schematic diagram of north-west Morocco circa AD 40

Abstract

In opposition to the view that has been promulgated for many years that there was continual conflict throughout North Africa between Roman and native during the whole of the imperial period, and a frontier was needed between the province and the outside, the author's conviction is repeated that no linear frontier existed in Mauretania Tingitana, since no conflict existed. Not only are there no literary, epigraphic or archaeological traces of warfare or destruction by hostile barbarian tribes, but the evidence of the 'treaty altars' which is discussed and illustrated with epigraphic reconstructions, indicates a stable relationship between the imperial procurator-governor and the leaders of the local tribe. In conclusion, it is added that the character of the procurators chosen to govern the province does not suggest any military activity.

Note on the inscriptions

The texts have been taken from IAM, 2, with amendments suggested by Ginette Di Vita-Evrard (1987) and Michel Christol and Andreina Magioncalda (1989); the stones have been drawn as they would have appeared when first set up. Later alterations (martelations and so on) have been omitted, but letters which are restored have been drawn with broken lines, or where the stone has been severely damaged, the surviving part has been shaded.

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Preventive conservation of salt-contaminated masonry in the Wakefield Tower, HM Tower of London

by CLIFFORD A. PRICE*

INTRODUCTION

Stone decay is a familiar and depressing problem. The loss of just a few millimetres from the surface of a piece of worked stone is enough to remove important detail and all traces of tooling; the loss of a centimetre or two is enough to obliterate all but the broadest intentions of the original craftsman.

When confronted with decaying stonework, one's immediate instinct is to 'do something to it'. This has been the underlying philosophy of innumerable attempts at stone preservation over more than two thousand years. However, most of the coatings and consolidants that have been applied to decaying stone have proved ineffective or sometimes positively harmful. The alternative philosophy, that of preventive conservation through environmental control, is of limited applicability in the case of external stonework. Nonetheless, it merits serious consideration for the interiors of roofed monuments.

Stonework on the interior of the Wakefield Tower, HM Tower of London, has been showing serious deterioration. Recent refurbishment of the Tower has provided the opportunity to assess the prospects for slowing down the decay through environmental control. The purpose of this paper is to describe an investigation which took place in 1992, and to set it in the context of our current understanding of decay processes.

SALT DAMAGE

Soluble salts are probably the most important cause of stone decay in temperate climates, and there are many ways in which stonework may become contaminated with salts. Common sources include air pollution, which reacts with calcareous stones to produce a range of salts, notably calcium sulphate; the soil, from which salts may be carried into masonry by rising damp; de-icing salt; wind-blown sea salt; unsuitable cleaning materials; incompatible building materials; and, in the case of some medieval buildings, the storage of salts for meat preservation or even for gunpowder.

Once in the stone, the salts can cause damage indefinitely. The damage characteristically

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consists of a powdering and weakening of the surface, leading to crumbling and eventual loss. This process is caused by the growth of salt crystals within the pores of the stone, either during crystallisation from solution or during the hydration of an anhydrous salt. Crystallisation is believed to be the more destructive of the two (Sperling and Cooke, 1984).

Salts crystallise out when the solution in which they are dissolved becomes super-saturated, either by loss of water through evaporation or by a change (usually a fall) in temperature. They redissolve when these conditions are reversed, and so the cycle of damage can continue indefinitely. Water to redissolve the salts may come, for example, from rain, from rising damp, or from water vapour in the air.

The last of these—water vapour in the air—is particularly important. The condensation of water vapour on cold surfaces is a familiar phenomenon, but it can also be extracted from the air by the salts themselves. All soluble salts pick up moisture from the air when the relative humidity (RH) of the air exceeds a certain value known as the 'equilibrium relative humidity'. Different salts have different equilibrium relative humidities; the equilibrium RH at 20°C of some of the salts that are commonly found in masonry are listed in Table 1.

Below the equilibrium RH, the salts exist as solid crystals. If the ambient RH rises to the equilibrium RH, the crystals begin to pick up moisture from the air and will continue to do so until they have all dissolved. If the ambient RH rises still further, more water will be picked up, and the resulting salt solution will become progressively more dilute.

If the ambient RH subsequently falls, water will evaporate from the solution. When the ambient RH falls as far as the equilibrium RH, the salt solution will become saturated and crystals will begin to deposit from the solution. If the ambient RH falls below the equilibrium

Table 1

sodium sulphate	93%
potassium sulphate	98%
calcium sulphate	100%
magnesium sulphate	90%
ammonium sulphate	81%
 sodium nitrate	 76%
potassium nitrate	94%
calcium nitrate	56%
magnesium nitrate	53%
ammonium nitrate	66%
 sodium chloride	 75%
potassium chloride	85%
calcium chloride	33%
magnesium chloride	34%
ammonium chloride	80%

RH, all the water will evaporate and all the salt will crystallise from solution. Figure 1 illustrates this behaviour for the case of a sample of stone that is contaminated with 1 per cent sodium chloride, which has an equilibrium RH of 75 per cent. A sample that was contaminated with a mixture of salts might be expected to exhibit a somewhat smoother curve.

The outcome of all this is that crystallisation damage is not dependent on cycles of wetting and drying, such as might occur in an outdoor environment. Quite small fluctuations of the ambient RH, to either side of the equilibrium RH, are all that is necessary for the salt to dissolve and recrystallise repeatedly, even in an indoor environment. This is amply demonstrated by the continuing deterioration of many stone artefacts in museum stores. Nonetheless, salt damage may be prevented simply by maintaining a constant temperature and constant relative humidity. This is easier in theory than in practice, of course. Stonework is seldom contaminated by a single salt and, as we shall see, salt mixtures are harder to deal with because they entail more than one equilibrium RH. Equally, it is impossible to maintain a constant relative humidity in an open room. Recommendations for environmental control in the Wakefield Tower must take both these factors into account.

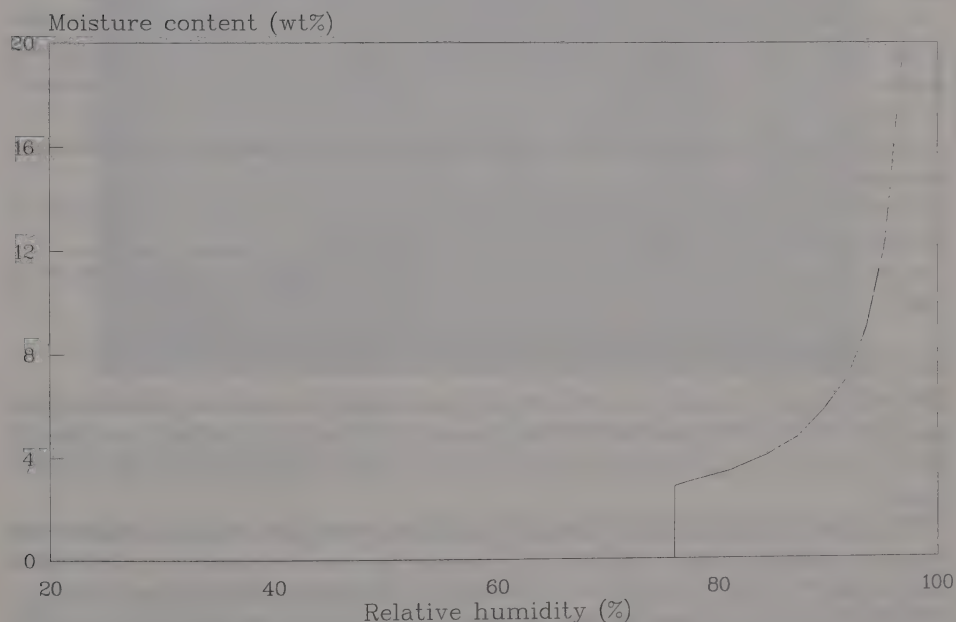


Fig. 1 Theoretical curve for sample containing one per cent sodium chloride by weight.

The Wakefield Tower

The Wakefield Tower was built in two phases between c 1220 and c 1240, in the reign of Henry III. It formed part of the royal suite in the contemporary palace buildings, and the upper of the two storeys served as Henry's privy chamber (Brown and Curnow, 1984: 53). In later years it served as part of the Record Office and from 1870 to 1967 the Crown Jewels were displayed there. The weight of the iron cage that contained the Crown Jewels had necessitated the insertion of a brick vault and other supports in the lower chamber, and removal of the Crown Jewels permitted the removal of these structures and excavation of the floor down to its original level. The masonry that was thereby revealed carried numerous traces of tool-marking, but in the twenty years that have followed the surface has deteriorated very markedly and it now seems almost impossible that some of this detail can be saved in anything but photographs.

The upper chamber also shows serious decay in some parts. The construction is primarily in Kentish Rag rubble with Reigate dressings, although there are later insertions of an oolitic limestone, suggesting that the decay of the Reigate stone is no new phenomenon. One area in particular, consisting of three courses of Reigate stone about two metres above floor level on the south-west face, was causing particular concern, for it had decayed back considerably further than other areas. Some parts of the stonework have been given surface treatments in recent years in an attempt to stop the decay, but without notable success. These have included multiple applications of limewater, by the Nimbus Conservation Group, Bristol, and the application of *Brethane* (a catalysed trimethoxymethylsilane system) by Colebrand Ltd, London.

The present investigation into the prospects for preventive conservation through environmental control was undertaken at the request of Mr Martin Caroe of Caroe and Partners, London, the architect appointed to the Tower by Historic Royal Palaces. The objectives were two-fold:

- a) to determine the ranges of ambient relative humidity that would minimise further deterioration in each chamber, and
- b) to establish the reason(s) for the particularly severe decay in the three courses of stone in the upper chamber (see above).

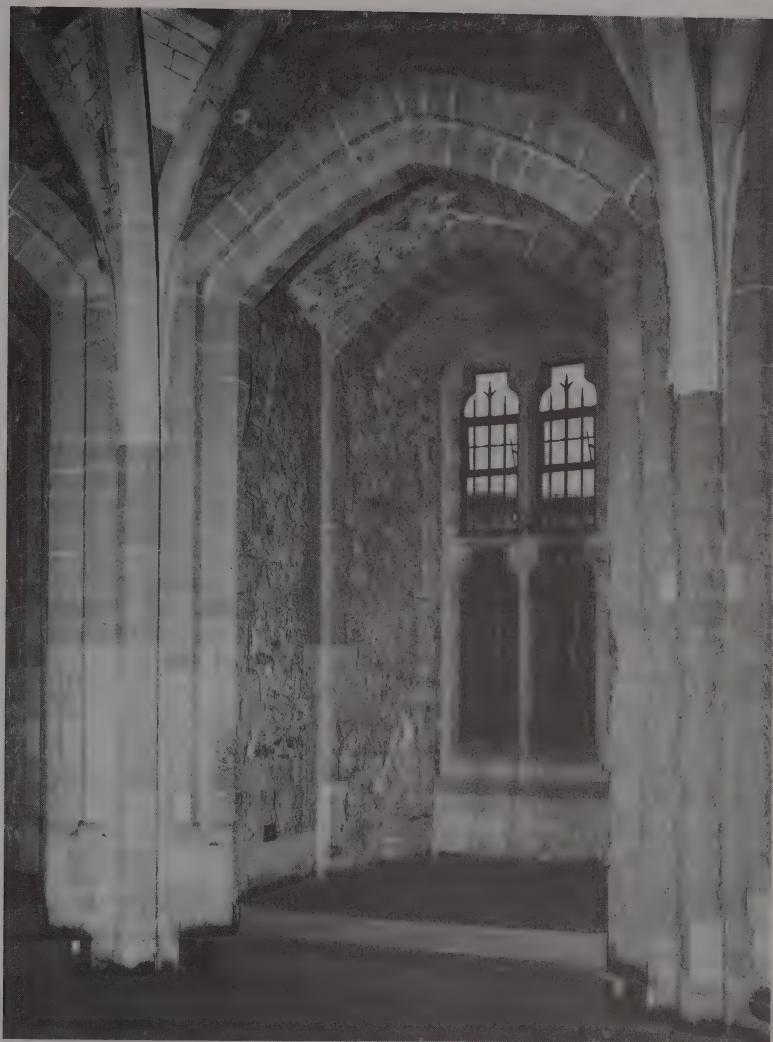
In the event, the second objective was not met on the first attempt, and a further set of samples was taken at a later date.

Sampling and analysis

In the first instance, samples were of two types: surface flakes of stone, and powder samples taken by drilling into the joints with a 10 mm masonry drill. Successive drillings were taken at different depths, to reveal variations of salt content with depth. Sample locations are shown in Figure 2.

Subsequent investigation in the laboratory consisted of two parts. First, the samples were exposed to a range of relative humidities to determine how much moisture they picked up at each humidity. Secondly, the samples were analysed to determine which salts were present.

Relative humidity control was achieved by the use of saturated salt solutions in an air-tight container. Relative humidities of 32, 55, 66, 75 and 85 per cent were achieved by the use of



The Wakefield Tower (courtesy of Historic Royal Palaces, Crown Copyright). Embrasure in the south-west corner of the upper chamber. The decay of the stone dressings can be seen in the profile on the right hand side. Photo Cliff Birtchnell.

calcium chloride, sodium dichromate, sodium nitrite, sodium chloride and potassium chloride respectively.

When the moisture measurements were complete, 1 g of each sample was shaken with 100 ml of distilled water, and the resulting solution was analysed for chloride, nitrate and sulphate. Chloride was determined by means of an Aquamerck test kit 11106, accurate to

2 mg/l. Nitrate was determined with Merckoquant test strips 10020, indicating nitrate contents of 0, 10, 25, 50, 100, 250 or 500 mg/l. Sulphate was determined by Merckoquant test strips 10019, indicating sulphate contents of below 200, over 400, over 800, over 1200 or over 1600 mg/l. Since the sulphate determination was relatively insensitive, 20 ml of each solution was evaporated to dryness, redissolved in 1 ml water and retested.

The second batch of samples, taken specifically to elucidate the reasons for the faster rate of decay of the three courses in the south-west corner of the upper chamber, consisted only of powder samples taken with a 15 mm masonry drill. They were taken from the stone itself, whereas the previous samples were taken from the joints. Moreover, they were taken at depths of up to 350 mm instead of the previous 100 mm. The moisture content of the drillings 'as taken' was determined by weighing the samples, and then drying to constant weight. They were then exposed to a relative humidity of 75 per cent until they reached constant weight. Salt contents were again determined semi-quantitatively using Merckoquant test strips and the Aquamerck test kit. A 1 g sample was shaken with 5 ml distilled water, and the resulting solution was tested for sulphate. The solution was then made up to 100 ml, and was tested for nitrate and chloride. The solution was subsequently evaporated to dryness to determine total soluble salt content.

Results

The results are presented in Table 2, and the moisture absorption of the drilled samples is illustrated in Figures 3 and 4.

A number of points are immediately evident:

- a) As expected, the salt content of the masonry is very high.
- b) The total salt content in the upper chamber is generally two to three times higher than in the lower chamber.

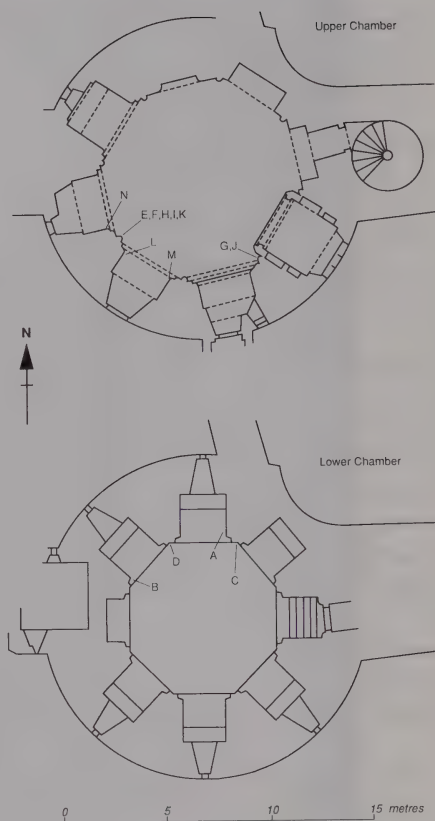


Fig. 2 Location of samples, after Brown and Curnow (1984).

Table 2.

location	remarks	height above floor level (m)	condition of stonework	moisture content (wt%) at relative humidity of					as taken	salt content (wt%)			
				32%	55%	66%	75%	85%		chloride	nitrate	sulphate	total
lower chamber													
A	mortar drillings, 0–40mm	0.3*	decaying	0.31	0.55	0.72	0.95	1.37		0.6	0.1	0.2–0.4	2.6
	40–80mm			0.14	0.32	0.41	0.55	0.86		0.4	<0.1	0.4	2.0
B	mortar drillings, 0–40mm	0.3*	decaying	0.23	0.43	0.57	0.73	1.08		0.1	<0.1	0.6	2.1
	40–80mm			0.49	0.88	1.09	1.42	2.24		0.4	<0.1	0.4–0.6	1.5
C	stone flakes	0–0.5*	decaying	0.83	1.67	2.10	2.67	4.26		0.5	<0.1	4.0	5.8
D	stone flakes	0–0.5*	decaying	1.75	2.99	3.65	4.46	6.97		0.6	0.1	4.0–8.0	10.0
upper chamber													
E	mortar drillings, 0–20mm	1.88	severe decay	0.78	1.56	2.26	5.97	9.98		2.0	0.5	<0.1	5.7
	20–40mm			0.84	1.75	2.74	6.94	10.50		1.6	0.5–1.0	<0.1	4.3
	40–60mm			0.62	1.40	2.27	6.60	10.20		1.9	0.5–1.0	<0.1	6.0
	60–100mm			1.88	3.59	5.21	8.56	13.00		1.8	1.0	<0.1	
F	mortar drillings, 0–20mm	1.3	severe decay	0.52	1.71	2.39	4.25	6.84		1.0	1.0	<0.1	4.2
	20–40mm			0.97	2.18	3.37	6.35	10.40		1.4	1.0	<0.1	5.4
	40–60mm			0.60	1.57	2.74	5.70	9.32		1.6	1.0	<0.1	5.9
	60–100mm			0.72	1.65	2.44	3.56	5.85		1.6	1.0	<0.1	5.5
G	mortar drillings, 0–20mm	1.72	sound	0.51	1.26	1.95	4.39	8.28		1.8	0.5–1.0	<0.1	5.4
	20–40mm			0.42	1.03	1.64	5.37	15.80		1.8	0.5	<0.1	5.2
	40–60mm			0.44	1.12	1.87	6.11	12.60		2.4	0.5	<0.1	5.8
	60–100mm			0.38	0.93	1.44	4.19	7.29		2.2	0.5	<0.1	5.0
H	stone flakes	1.9	severe decay	2.62	5.34	7.70	14.5	22.00		3.2	1.0–2.5	<0.1	12.0
I	stone flakes	1.7	severe decay	1.67	4.13	6.70	9.59	14.90		2.4	2.5	<0.1	14.0
J	stone flakes	1.8	decaying	1.24	2.81	4.30	6.93	10.50		2.2	1.0	<0.1	6.8
K	stone drillings, 0–50mm	1.78	severe decay				15.8		9.2	2.6	2.5–5.0	<0.1	14.9
	50–100mm						15.4		9.3	2.8	2.5–5.0	<0.1	16.6
	100–150mm						17.2		9.1	2.8	2.5	<0.1	15.0
	150–200mm						13.2		9.2	2.3	2.5	<0.1	
	200–250mm						12.5		9.1	2.3	2.5	<0.1	8.7
	250–300mm						12.2		9.4	1.9	2.5	<0.1	
	300–350mm						12.1		8.5	2.1	2.5	<0.1	8.6
L	stone drillings, 0–50mm	0.8	sound				12.7		9.7	1.3	2.5–5.0	<0.1	10.1
	50–100mm						12.7		10.0	1.6	2.5–5.0	<0.1	11.5
	100–150mm						12.5		10.0	1.6	2.5	<0.1	11.5
	150–200mm						12.4		10.1	1.6	2.5–5.0	<0.1	10.9
	200–250mm						11.9		10.1	1.6	2.5–5.0	<0.1	13.6
M	stone drillings, 0–50mm	0.8	sound				9.2		7.4	1.3	1.0–2.5	<0.1	9.3
	50–100mm						9.8		8.2	1.4	2.5	<0.1	12.3
	100–150mm						9.1		7.9	1.4	2.5	<0.1	9.0
	150–200mm						9.0		7.7	1.2	2.5	<0.1	12.9
	200–250mm						8.7		7.9	1.3	2.5	<0.1	7.7
N	stone drillings, 0–50mm	1.63	severe decay				14.2		10.2	2.8	2.5	<0.1	16.7
	50–100mm						13.6		10.2	2.2	2.5	<0.1	14.8
	100–150mm						15.9		10.1	2.8	2.5	<0.1	16.4
	150–200mm						16.4		10.1	2.6	2.5	<0.1	14.0
	200–250mm						15.9		13.9	2.8	2.5	<0.1	11.5

*height above floor level of recess

- c) The higher salt content of the upper chamber is largely attributable to chlorides and nitrates.
- d) No sulphates were detectable in the upper chamber, whereas sulphate levels were high in the lower chamber.
- e) The surface flakes have much higher salt contents than the drillings. This is to be expected, since evaporation from the surface will concentrate salt in the flakes.
- f) The salt content does not show much variation along the length of the drillings (although it has to be remembered that even the maximum drilling depth of 350 mm is only a small fraction of the wall thickness).
- g) The stone samples drilled from the three particularly decayed courses in the south-west corner of the upper chamber contained about twice as much chloride as stone samples taken from other parts of the upper chamber. However, this difference was not reflected in the mortar samples.
- h) Where measured, the moisture content of the masonry in the upper chamber was reasonably constant to a depth of at least 250 mm, and the three more decayed courses were not significantly wetter than the sound stonework. The moisture content was lower than it would have been if the stonework had been in equilibrium with a relative humidity of 75 per cent.

The marked difference in both the degree and the nature of the salt contamination in the two chambers may be seen by comparing Figures 3 and 4. The samples from the upper chamber show a sharp increase in moisture content, going from 66 to 75 per cent RH, whereas the samples from the lower chamber show a much more modest increase in moisture content, even above 75 per cent RH. Given the data of Table 1, this is entirely consistent with the high sulphate content of the lower chamber and its relatively low chloride and nitrate content.

Discussion

The results provide all the explanation that is necessary for the deterioration of the stonework. The stone contains exceptionally high levels of salts—higher even than those recorded in some parts of the Salt Tower (Bowley, 1975).

It is not immediately apparent why the upper chamber should contain much higher levels of nitrates and chlorides than the lower chamber. Although Arnold and Zehnder (1991: 110) have shown that nitrates and chlorides are carried by rising damp to greater heights than sulphates, it seems implausible that rising dampness should be reaching the upper chamber. It is more likely that the answer lies in differences in past usage.

Upper chamber

The decay of the three courses in the south-west corner may be attributed to their higher chloride content, although the reason for the unusually high contamination is not known. There is no reason to believe that the decay is attributable to dampness penetrating from outside or from below: the moisture content of the stonework was less than it would have been if the stonework had been in equilibrium with a relative humidity of 75 per cent. The moisture may therefore be attributed solely to the presence of the hygroscopic salts.

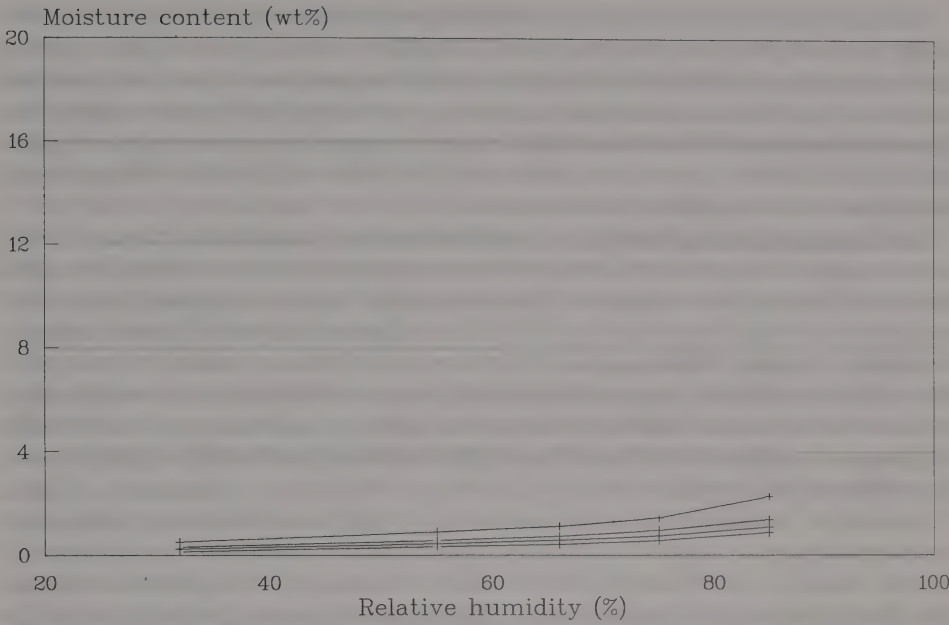


Fig. 3 Drillings from the lower chamber

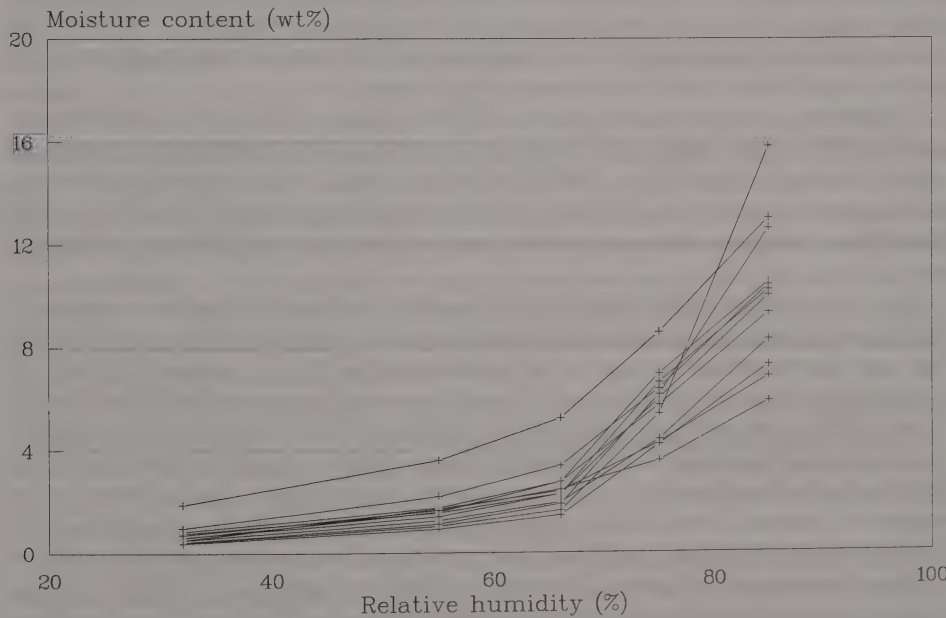


Fig. 4 Drillings from the upper chamber

Turning to the chamber as a whole, it is necessary to consider whether an attempt should be made to *remove* the salts from the masonry. Bowley's work in the Salt Tower (1975) demonstrated that repeated applications of clay poultices can achieve a short-term reduction in salt levels, but that the contamination was likely to re-occur as fresh supplies migrated out from the massive core of the masonry. His work did not give any grounds for believing that desalination would be worthwhile or practicable in the Wakefield Tower, and environmental control therefore remained the preferred option.

How should the relative humidity be controlled in order to minimise salt damage? There are two options. On the one hand, the relative humidity may be kept so low that all the salts remain in the solid state at all times. Broadly speaking, this means keeping the humidity below the lowest equilibrium humidity of each of the salts that are present. The other option is to maintain the relative humidity at such a high level that all the salts remain in solution at all times. This means keeping the humidity above the highest equilibrium relative humidity of all the salts that are present. Anything between these limits is dangerous, since the inevitable fluctuations in ambient relative humidity are liable to cause crystallisation and dissolution of one or other of the constituent salts.

In principle, implementation of this approach is straightforward. One could take a dried sample and determine its constituent salts by X-ray diffraction. (Analysis of a solution would be of no value, for it would identify only the constituent ions, and not the particular combination of salts that will crystallise out from it. Prediction on the basis of solubility products is feasible but untried in this context.) Given the relative proportions of the constituent salts and their equilibrium relative humidities, one could begin to predict the ambient humidities at which significant crystallisation and dissolution might occur. Moreover, if one knew the stresses that could be generated by the crystallisation of individual salts, one might predict the ambient humidities at which serious damage would occur.

Unfortunately, our knowledge is not yet sufficiently advanced, and some of the thermodynamic models of salt damage that have been presented in the conservation literature are currently being challenged (Price, 1991). For the time being, a more empirical and down-to-earth approach is appropriate. This relies on the experimental determination of the ambient humidities at which the stonework absorbs moisture from the air, as illustrated in Figures 3 and 4.

Which of the two humidity regimes should be adopted in the upper chamber—permanently high or permanently low? The high option is unacceptable on a number of grounds. Given the high equilibrium humidities of some of the nitrates and chlorides (e.g. potassium chloride 85 per cent; potassium nitrate 94 per cent), it would be necessary to keep the relative humidity close to 100 per cent in order to prevent any crystallisation. This would necessitate humidifying plant; it would endanger timber and other organic materials; it would engender biological growths; and it would entirely defeat any attempt to convey the regal splendour of the chamber to visitors. There was therefore no alternative but to keep the humidity at a low enough level to keep the salts in the solid state at all times. But how low does this need to be?

The moisture content of almost all the samples from the upper chamber showed a marked increase between 66 and 75 per cent RH. It is likely that much of the absorption takes place at

the top end of this range, as the equilibrium RH of sodium chloride is 75 per cent and for sodium nitrate it is 76 per cent (cf. Figure 1). To be on the safe side, however, **it is recommended that the relative humidity in the upper chamber should be kept below 66 per cent at all times.** This margin of safety is consistent with Arnold and Zehnder's assertion that some salts do not crystallise out in practice until the ambient RH falls well below the equilibrium RH (1990: 47).

How does the recommended humidity regime compare with existing humidity levels in the Tower? Only limited information is available, based on monitoring undertaken by Allington of Historic Royal Palaces between February and June 1992. This showed the relative humidity fluctuating mainly in the range 60 to 80 per cent, i.e. the worst possible conditions, given the presence of chlorides and nitrates.

In view of the somewhat simplistic approach and the absence of full quantitative analyses, it would be naive to think that decay would be stopped altogether by keeping the ambient RH below 66 per cent. Nonetheless, a substantial reduction in the rate of decay would certainly be achieved. Some efflorescence would probably occur during the initial drying out, and this could be accompanied by some further powdering of the surface. Thereafter, the condition of the stonework should stabilise.

Lower chamber

The lower chamber presents more difficult problems. Here too one could minimise damage from those salts that are already near the surface by maintaining relatively dry conditions and thereby preventing crystallisation damage. On the other hand, there can be little doubt that the lower parts of the masonry are in contact with groundwater, and that dry conditions in the chamber would lead to a steady deposition of fresh salts being drawn up continuously from the soil.

One is therefore obliged to adopt the opposite strategy from that adopted in the upper chamber, and maintain the RH at a *high* level. Allington's data, albeit limited, suggests that the RH is already high: more than 80 per cent for much of the period monitored. But how high does it need to be to prevent deterioration, and what are the potential problems? Sulphates and chlorides are both present in the lower chamber. The equilibrium RHs of sodium sulphate, potassium sulphate, calcium sulphate and magnesium sulphate are 93, 98, 100 and 90 per cent respectively. Potassium sulphate and calcium sulphate will thus remain crystalline under all but the most exceptional conditions, whereas sodium and magnesium sulphates are capable of causing damage at RHs already observed in the lower chamber. Moreover, these salts can exist in both anhydrous and hydrated forms; the transition between Na_2SO_4 and $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, for example, takes place at 71 per cent at 20° C, with the attendant risk of volume expansion on hydration. Turning to the chlorides, the equilibrium RHs of sodium and potassium chlorides are 75 and 85 per cent respectively. To avoid damage due to these salts, it would be necessary to keep the RH above 85 per cent at all times.

On this simplistic appraisal, which ignores possible salt interactions and any possible absorption/desorption hysteresis, it appears that the preferred humidity regime lies between 85 and 90 per cent. However, it is unrealistic to suppose that the RH in the chamber could be

maintained within such tight limits. There is also a danger that algae would flourish at these levels, and there are all the practical problems associated with a very high RH in the lower chamber and a much lower RH in the upper chamber.

It is clear that there can be no definitive solution to the problems of the lower chamber. On balance, **it is recommended that the relative humidity should be maintained above 75 per cent at all times and should preferably not exceed 90 per cent.** A somewhat lower maximum level may prove necessary if algal growth becomes a problem. This regime will eliminate damage due to sodium chloride and (except at very high temperatures) it will avoid damage due to the expansion of anhydrous sodium sulphate. It will minimise evaporation from the surface of the masonry and will thus minimise the migration of further salts from the soil. It will slow down the rate of decay but there seems to be no practicable way of arresting the decay altogether.

Implementation

It is easy to make recommendations concerning environmental control; it is quite another thing to put them into practice. The task is made even harder when the spaces to be controlled are within the confines of an outstanding historic building such as the Tower of London. There is nowhere to conceal plant, and almost any disruption of the fabric has archaeological implications. This unenviable task is currently being considered by the architect's team.

Implications for future research

The investigation has highlighted the rudimentary nature of our knowledge concerning the control of salt damage. Areas which require further research include:

- a) the possible existence of a 'threshold concentration' below which salt damage does not occur. (It is remarkable that some of the masonry at the Tower is unscathed despite salt levels that are about half those of severely decayed stone.)
- b) Absorption/desorption hysteresis, whereby salts crystallise out at relative humidities below their equilibrium RH.
- c) The behaviour of salt mixtures—do the constituent salts crystallise out at precisely the same equilibrium RHs as the pure salts?
- d) The mechanism of damage through crystal growth.
- e) The prevention of crystallisation damage through the use of compounds that modify crystal habits.

Some of these topics are already being examined at the Institute of Archaeology, and it is hoped that further efforts will generate new solutions to the problems of salt damage which are typified in the Wakefield Tower.

Acknowledgements

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Abstract

Stonework in the Wakefield Tower is decaying through the action of soluble salts. Attempts to conserve the stonework by the application of consolidants and surface coatings have proved unsuccessful over the years. This paper describes an alternative approach to conservation, whereby the relative humidity within the Tower would be held within ranges that would minimise the repeated crystallisation and dissolution of salts.

Samples removed from the Tower have revealed marked differences in the degree and nature of salt contamination in the upper and lower chambers. Two different humidity regimes are therefore recommended.

The investigation is set into the context of current knowledge about salt decay processes.

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Review

BISHOP, Michael C. and **COULSTON**, Jon N.C. *Roman Military Equipment*, London: Batsford, 1993. 256 pp.; 143 line, 15 colour ill. ISBN 0-7134-6637-5. £35.00

The study of Roman military equipment has blossomed over the last decade. This has been due mainly to the efforts of M.C. Bishop. Bishop, who did his Ph.D on Roman military equipment of the first century AD, has endeavoured to bring together the various people working in the field, ranging from historians and archaeologists to re-enactment societies and armourers, to coordinate their studies and experience. Bishop quite rightly feels that armourers and re-enactment societies have much to offer provided they keep their reconstructions and experiments within the limits of the evidence. He publishes a regular news sheet, *Arma*, and *The Journal of Roman Military Equipment Studies*. Coulston, the co-author, did his Ph.D thesis on Trajan's Column and has been closely associated with Bishop for many years.

This is the only comprehensive book on the subject. It gives an overview of Roman military equipment from the middle Republic through to the fall of the Western Empire. Its scope ranges from armour and weapons to catapults, tools, clothing and tents. The archaeological evidence is analysed period by period and, where possible, related to the pictorial evidence. The unreliability of such evidence is stressed, in particular the imperial propaganda monuments such as Trajan's Column at Rome which stands in total contradiction to the contemporary monument at Adamklissi in Romania, the former showing legionaries dressed exclusively in plate armour whilst the latter depicts them in mail and scale.

It is refreshing to see long-established views, such as the identification of palisade stakes, questioned. Polybius provides a detailed description of such stakes and how they were used to construct breastworks. It would be impossible to erect any sort of breastwork with the double pointed staves discovered at the Saalburg and elsewhere.

There are useful chapters on production and technology and a discussion of that thorny question 'can one identify legionary as opposed to auxiliary equipment?' It tends to be a circular argument but it is useful to have it aired.

The evidence is uneven; the wealth of material for the first century AD contrasts starkly with the paucity of material from the later Republic and the mid Empire. This is partly because the research has mainly been centred on Germany and Britain. The lack of evidence for the later Republic is particularly sad as it was the great era of conquest. Virtually nothing is known of Roman weaponry from the Punic and Macedonian wars. Evidence must exist in Italy and particularly in Spain where there was a permanent military presence, but if so, it has either not been identified or not published.

This book must prove an essential guide. It is concise, lucid and excellently illustrated. Like all such books it can be criticised for its omissions. Specialists will undoubtedly pick holes in it but it was much needed and will be well appreciated.

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Notes to Contributors

Papers on any aspect of archaeology may be considered for publication in the *Bulletin*. All contributions and related correspondence should be addressed to the Editor, Professor J.J. Wilkes, Institute of Archaeology, 31–34 Gordon Square, London WC1H 0PY. The following notes are provided as a guide to intending contributors in the preparation of their material.

1) *Typescripts* should not normally exceed 10,000 words in length. They should be typed on one side only of A4 size paper (approx. 30 cm by 21 cm), using double spacing and leaving wide margins (at least 4 cm on the left). Two copies of the typescript should be submitted, the author retaining a third copy (complete with duplicate figures, plates and tables). If possible, authors are asked to provide, in addition, a copy of the text on disk (preferably in Microsoft Word for Macintosh or ASCII files).

2) *Footnotes* should be avoided as far as possible. If any are judged to be absolutely necessary, they should be typed on a separate sheet, not at the foot of the page to which they refer.

3) *Bibliographical references* should follow the so-called Harvard system. The author's last name, date of publication and the significant page number should be given in brackets in the body of the text, e.g. (Sharma, 1973: 29), or, if the author's name has been cited, simply (1973: 129). Full references should be listed alphabetically according to the authors' names at the end of the paper. For example:

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Sharma, G.R. 1973 Mesolithic lake cultures in the Ganga valley, India. *P.P.S.*, 39: 129–146.

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Butzer, K.W. 1972 *Environment and Archaeology*. London: Methuen.

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which may be consulted, e.g. the ones printed from time to time in the *American Journal of Archaeology*, the *Index des Périodiques* supplement to *l'Année Philologique*, Vol 51, 1982 (for journals dealing with Classical and Mediterranean archaeology chiefly) and the Council for British Archaeology's lists in *British Archaeological Abstracts* (for British periodicals).

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10) *Submission date*: articles should be received not later than **1 April** for inclusion in that year's *Bulletin*. Articles will not be accepted unless complete with all illustrations, captions, etc. Twenty-five offprints of each paper will be supplied free to the author. Additional offprints may be purchased at cost price; estimates of cost can be obtained on application.

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